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NOTES ON MIMOSOIDEAE : II.

J. P. M. BRENNAN

All cited specimens are, unless otherwise indicated, in the Herbarium of the Royal Botanic Gardens, Kew.

Dichrostachys (DC.) Wight et Arn.

Baker f. (Leg. Trop. Afr. 807-8 : 1930) and Gilbert & Boutique (in Fl. Congo Belge 3, 198-203 : 1952) maintain three species as distinct : *D. glomerata* (Forsk.) Chiov., *D. platycarpa* Welw. ex Oliv. and *D. nyassana* Taub.

Baker's key is as follows :—

Pinnae in 5-12 pairs :

Leaflets linear-oblong, 3-4 mm. broad *D. nyassana*

Leaflets linear, narrower than above *D. glomerata*

Pinnae in 10-18 pairs. Leaflets 2-3 mm. long. Pod broad, much contorted *D. platycarpa*

Gilbert & Boutique separate them in the following way :—

Folioles de 1.5-5 mm. de large ; pennes 7-12 (-13) paires ; épis généralement réunis en fascicules ; pédoncule de 2.5-3 cm. de long
D. nyassana

Folioles ne dépassant guère 1 mm. de large ; épis solitaires ou géminés ; pédoncule ne dépassant guère 2.5 cm. de long :

Pennes (10-) 14-21 paires ; folioles étroitement linéaires-oblongues, atténuées-aiguës au sommet *D. platycarpa*

Pennes 5-11 (-13) paires ; folioles linéaires-oblongues, arrondies-obtuses à subaiguës au sommet *D. glomerata*

It will be observed that the distinguishing characters used in both works are foliar : number of pinnae and shape and size of leaflets :

except that Baker f. uses the width of the pod as a secondary character of *D. platycarpa* and Gilbert & Boutique likewise use the length and arrangement of the peduncles.

The writer has found difficulty in separating these three species, and, to judge from the naming of herbarium-specimens, he is not alone in this. It seemed therefore desirable to test the constancy of the alleged characters.

Number and collector of specimen, and territory of origin.	Number of pinnae (count of five leaves).	Length of leaflets (mm.) near middle of pinnae.	Width of leaflets (mm.)	Apex of leaflets acute (A) or obtuse to sub-acute (0).	Peduncle length (cm.)	Spikes solitary or not.
Jeffery K83, Kenya	(3-) 5-9	1-2	0.3-0.4	0	1.5-1.9	solitary
Wallace 757, Tanganyika	6-9	4-5	0.6-1.1	A	1-3	fascicled
Dawe 898, Uganda	5-6	2.5-4	0.7-1	0	2-3	solitary
Harris 74, Uganda	11-14	4.4-7.5	0.75-1	A	1-2	solitary or paired
Gillett 12910, Kenya	5-10	2-4.5	0.75-1.2	0	1.5-3.5	solitary or paired
Dawe 392, Uganda	5-8	4.5-7	0.75-2.3	A	2.5-4	paired
Dawkins 542, Uganda	(10-) 13-15	3-3.75	0.8-0.9	A	1-2	fascicled, rarely solitary
Thomas 2193, Uganda	9-12	3.5-4.25	0.8-1	0	2-6	solitary or up to 3 together
Edwards 1641, Kenya	10-13	3.7-4.7	0.9-1.3	A	2-4.5	solitary
Chandler 613, Uganda	10-11	4.5-6	1.1-1.9	0	3-5.5	paired or fascicled
Semsei 2894, Tanganyika	(6-) 10-12	4.5-6	1.1-2	0	4	solitary, sometimes paired
Burt 1213, Tanganyika	6-8	5-9	1.3-3	0	2.5	?
Shabani 27, Tanganyika	6-11	6-8	1.7-2.75	0	3-5	fascicled
Stolz 431, Tanganyika	4-8	7-13	1.7-4.5	0	2.5-6	solitary or paired

The width of the pod seems certainly to reach its maximum in *D. platycarpa* though the widest I have seen is 2 cm. In a specimen from the Belgian Congo (Libenge, Léontovitch s.n.) otherwise agreeing with *D. platycarpa* the pods are only 1.4-1.6 cm. wide, a width readily duplicated in typical *D. glomerata* (e.g. Kenya, Egerok, Bally 5451, with pods

1.3–1.5 cm. wide). In *Shantz* 418 (Rhodesia, Victoria Falls) acute leaflets are combined with pods only 1 cm. wide. It seems therefore that the tendency to wide pods in *D. platycarpa* is a true one, but inconstant and thus no more than a tendency.

The other characters I have tested on a number of specimens, and the results are given in the above table. The specimens are arranged in order based on increasing width of leaflet, and all are in the Kew Herbarium.

If the above table be examined and compared with the diagnostic characters of Baker f. and of Gilbert & Boutique already quoted, it will be found that no character tabulated shows more than incomplete correlation with any other, and that the overlapping is considerable. In other words, the morphological characters used show no clear discontinuities between the three taxa. Hybridity may be a factor, but intermediates are so frequent that it seems hardly feasible to maintain the three species as distinct.

The range of habitat of *D. glomerata* is very wide, from thorn-scrub to swamp-forest, and the altitude is from sea-level to over 1700 m. It seems likely that *D. glomerata* may be an aggregate of ecotypes with minor morphological distinctions.

D. nyassana is, when extreme, easily recognised, and appears to have a geographical range mainly in southern tropical Africa, and to be rare or absent elsewhere in the main area of *D. glomerata*. It seems worth maintenance, although not as a species. It is also possible that *D. platycarpa* may prove variably or subspecifically separable, although for the present I consider it better looked upon as merely part of the range of variation within the species.

The following arrangement is suggested, therefore. I have not attempted to repeat the full synonymy, most of which can readily be found in Baker f., Leg. Trop. Afr. 807–8 (1930) or in Benth. in Trans. Linn. Soc. **30**, 382 (1875).

Dichrostachys glomerata (Forsk.) Chiov. in Ann. Bot. Roma **13**, 409 (1915).

subsp. ***glomerata***

Mimosa glomerata Forsk., Fl. Aegypt.-Arab. 177 (1775).

Mimosa nutans Pers., Syn. **2**, 266 (1807).

Dicrostachys nutans (Pers.) Benth. in Hook., Journ. Bot. **4**, 353 (1841).

Dicrostachys platycarpa [Welw., Apont., in Ann. Conselho Ultramarino **1858**, 576 (1858), *nomen subnudum*] Welw. ex Oliv. in Fl. Trop. Afr. **2** : 333 (1871).

Dicrostachys nutans (Pers.) Benth. var. *typica* Lanza in Boll. Ort. Bot. Palermo, **8**, 106 (1909).

Dicrostachys nutans (Pers.) Benth. var. *grandifolia* Lanza in Boll. Ort. Bot. Palermo, **8**, 106 (1909).

Dicrostachys glomerata (Forsk.) Chiov. var. *grandifolia* (Lanza) Bak. f., Leg. Trop. Afr. 808 (1930).

Although there is apparently no specimen of *Mimosa glomerata* in Forskål's herbarium, and the species is thus typified by the too brief diagnosis in Fl. Aegypt. Arab. (*l.c.*), it relates to a plant in Arabia, and it is reasonable to interpret *M. glomerata sensu stricto* in the sense that authors such as Baker f. and Gilbert & Boutique have adopted, and to reject the idea that it might refer to var. *nyassana*, which is not known from so far north.

A careful revision of the complex may well show that the Indian *D. cinerea* Wight et Arn., Prod. Fl. Ind. Or. 271 (1834) cannot be maintained as a distinct species. Wight & Arnott cite "*Mimosa cinerea* L., Sp. Pl. 1505" as the first basonym, referring to the second edition of the *Species Plantarum* (1763). This appears to provide the earliest epithet for the complex; however, it is invalid, for there is a *M. cinerea* L., Sp. Pl., ed. 1, 517 (1753), based on a reference in Plukenet's *Almagestum Botanicum* and an inadequate figure. Whatever Plukenet's plant may have been, it had a prickly stem which is found in no known species of *Dichrostachys*, and also unijugate pinnae. *Mimosa cinerea* L. (1763) is a later homonym of *M. cinerea* L. (1753). The first valid use of the epithet *cinerea* in its later sense is *Desmanthus cinereus* Willd., Sp. Pl. 4, 1048 (1806), and if *D. cinerea* is maintained as a species, it should be cited as of " (Willd.) Wight et Arn." This name, however, does not antedate *D. glomerata* (Forsk.) Chiov.

subsp. **nyassana** (Taub.) Brenan, subsp. et comb. nov.

Dichrostachys nyassana Taub. in Pflanzenw. Ost-Afr. C, 195 (1895).

It might be assumed, from the description, that *D. nutans* var. *grandifolia* Lanza in Boll. Ort. Bot. Giard. Col. 8, 106 (1909) might provide a valid name for this taxon. Through the kindness of the Director of the Istituto ed Orto Botanico of the University of Palermo, I have been able to examine the type of Lanza's variety: Eritrea, between Ghinda and Filfil, 28 May 1906, *Senni* 256. The leaflets are mostly 1.25–1.8 mm. wide, but some a little more or less. The peduncles appear to be solitary and about 2.5 cm. long. The specimen is certainly not typical *nyassana*, and I would place it as a form of subsp. *glomerata* with somewhat larger leaflets than usual. Intermediates between subsp. *glomerata* and *nyassana* occur, and *Senni* 256 may perhaps be an example, although the fact that typical *nyassana* is not known from Eritrea makes this an improbable suggestion.

Acacia latronum (L.f.) Willd.

For reasons to be discussed later, I do not consider that the plant of north-eastern Africa variously called *Acacia bussei* Harms ex Sjöstedt var. *benadirensis* Chiov. or *A. benadirensis* Chiov. is specifically separable from the Indian *Acacia latronum* (L.f.) Willd.

The typification of *A. latronum* presents some difficulty, and this problem requires consideration first. There is in the Linnean Herbarium in London a specimen (No. 1228.26) collected by Koenig and annotated as "*latronum*" in the hand of Linnaeus fil. (see Savage, Cat. Linn. Herb. 184: 1945). It might seem that this could reasonably be accepted as the type-specimen of *Acacia latronum*. This specimen, which, through the

help of Mr. N. Y. Sandwith, I have had the privilege of examining at Kew, bears a twig with spines and leaves from which two flower-spikes project. The spikes are not actually attached to the twig, however. They are distinctive, owing to the very small calyces and four corolla-lobes (shown by a flower not quite open on the left-hand side of the right inflorescence), and agree with those of *A. latronum* as it has since been interpreted by those dealing with this species in India.

The twig, however, does not agree with those of *A. latronum* on account of :—

- (a) the leaflets being in 3–4 pairs, not 5 or more ;
- (b) the leaflets being broader in relation to their length, not linear-oblong as in *A. latronum* ;
- (c) a gland on the leaf-rhachis between the topmost pair of pinnae, which is absent in *A. latronum*.

The last character is most important, and leaves no doubt that the twig and inflorescences of 1228.26 are not conspecific. In fact the twig, together with its spines and leaves, agrees excellently with those of *Acacia eburnea* (L.f.) Willd. as currently interpreted (e.g. with *Hooker f.* and *Thomson s.n.* in Herb. Kew. from Mysore, which is annotated as having been compared with the type of *Mimosa eburnea* L.f.). *Acacia eburnea*, though superficially slightly resembling *A. latronum*, has capitate not spicate inflorescences, and very different, narrow, falcate pods. The specimen 1228.26 is thus a mixture of inflorescences of *A. latronum* and vegetative parts of *A. eburnea*.

Let us now consider the actual description of *A. latronum* by Linnaeus fil. in Suppl. Pl. 436 (1781). There are here notes on the locality (“infra montem Tripully frequens . . .”) habit (“*Frutex . . . ramosissimus, depressus*”) and a description of the fruit (“*Legumen compressum, semilunatum*”), which certainly cannot have been taken from the specimen 1228.36, as it shows no pods, and which possibly represent observations of Koenig himself, who is indicated as the discoverer of *A. latronum*. The description applies well enough to *Acacia latronum* as subsequently interpreted, except for the mention of “*foliolis quadrijugis*”, which fits *A. eburnea* but not *A. latronum*. The vegetative parts of the two are rather similar, however, and it is difficult if not impossible to know exactly how much of the description is based on *A. eburnea*. The spicate inflorescences and semilunate pods (highly characteristic of *A. latronum*) mentioned in the description make it clear that Linnaeus fil. intended to describe *A. latronum* and that the admixture of *A. eburnea* was an unfortunate accident.

I therefore propose that *A. latronum* be typified by the inflorescences of the specimen 1228.26 in the Linnaean Herbarium, and by the description of Linnaeus fil. in Suppl. Pl. 438 (1781), excluding the mention of “*foliolis quadrijugis*”. An isotype, similarly mixed, is in the herbarium of the British Museum (Natural History).

The African plant called *A. bussei* var. *benadirensis* or *A. benadirensis* must now be discussed. It has been frequently confused with *A. bussei* Harms ex Sjöstedt, but, though closely related, the two are certainly distinct species, the former differing from *A. bussei* in habit, the usually

more glabrescent leaflets and inflorescence-axes, which are also usually shorter, the enlarged spines not constricted at base, the corolla 2-2.5 times as long as the calyx, not 3-5 times as in *A. bussei*, and in the wider curved pods. I must here thank Mr. J. B. Gillett who had previously investigated the differences between these two, and kindly placed his valuable results at my disposal.

A comparison between Indian material of *A. latronum* and African of *A. bussei* var. *benadirensis* shows most striking similarity between the two. In fact *A. latronum* differs only in having normally (but not invariably) longer inflorescences, a somewhat shorter calyx, a slightly longer corolla, and usually \pm puberulous pods. These are not sufficient in my opinion to justify more than subspecific separation—the smallness of the differences can be seen from the actual measurements given in the descriptions.

A. bussei Harms ex Sjöstedt var. *benadirensis* Chiov. was published in Miss. Stefanini-Paoli, Bot., 72 (1916), and based on *Paoli* 94 and 131 *bis* from Mogadiscio in Italian Somaliland. Through the courtesy of Prof. Dr. R. E. G. Pichi-Sermolli, both these syntypes have been sent on loan to me. They are probably conspecific, but *Paoli* 131 *bis* is not representative, while *Paoli* 94 is a splendid gathering of *benadirensis*, which I accordingly choose as the lectotype. Surprisingly Chiovenda distinguished his var. *benadirensis* from typical *A. bussei* only by the unimportant difference of the leaflets being a little larger, but neither of the syntypes appears to be *A. bussei*.

In 1932, Chiovenda published *Acacia benadirensis* in Fl. Somalia 2, 183. Although he used the same epithet as in his earlier variety of *A. bussei*, there is no evidence that the later species was in any way based on the earlier variety. Different and improved distinguishing characters were used, and a new array of syntypes cited, but without mention of the earlier ones. *Scasselati* 66, 177, 178, *Senni* 196, 691, 798 were cited; of these the *Scasselati* specimens have not been available to me, but the *Senni* ones, thanks again to Prof. Dr. Pichi-Sermolli, I have examined; *Senni* 798 is *A. bussei*, while 196 and 691 are *benadirensis*. If *Acacia benadirensis* is upheld as an independent species, then *Senni* 196, which shows twigs, spines, leaves, buds, flowers and pods might be quite suitably chosen as the lectotype.

Descriptions of the two subspecies of *A. latronum* follow :—

***Acacia latronum* (L.f.) Willd., Sp. Pl. 4, 1077 (1806).**

Mimosa latronum L.f., Suppl. Pl. 438 (1781).

subsp. ***latronum***

Axis inflorescentiae 1.5-3.5 cm. longus. Calyx 0.3-0.7 mm. longus. Corolla 2-2.5 mm. longa. Legumina saepe leviter puberula praesertim basin versus necnon secundum suturas.

Habitat in India. Typus : India, *Koenig*, pro parte (lectotypus ! in Herb. Linn., isolectotypus ! in Herb. Mus. Brit.).

There is considerable further synonymy for subsp. *latronum* which may be found in works on the flora of India, and which need not be recapitulated here.

subsp. **benadirensis** (Chiov.) Brenan, subsp. et comb. nov.

Acacia bussei Harms ex Sjöstedt var. *benadirensis* Chiov. in Miss. Stefanini-paoli, Bot., 72 (1916) ; Eggeling, Indigenous Trees of Uganda, ed. 2, 205 (1952), but flowers not in globose heads as there stated.

Acacia benadirensis Chiov., Fl. Somalia, 2, 183 (1932), pro parte, saltem quoad spec. cit. e Somalia Senni 196, 691.

Axis inflorescentiae 1-1.5 (raro usque ad 4.5) cm. longus. Calyx 0.8-1 mm. longus. Corolla 2 mm. longa. Legumina plerumque glabra vel fere glabra.

Habitat in Africa. Typus : Somal. ital., Mogadiscio, Paoli 94 (lectotypus ! in Herb. Florent.).

The subsp. *benadirensis* has been found in British and Italian Somaliland, Ethiopia, the Anglo-Egyptian Sudan, Kenya and probably Uganda.

Acacia mellifera (Vahl) Benth. & ***A. detinens*** Burch.

Examination of the ample Kew material of these two alleged species shows they do not differ from one another in the structure of their flowers or fruits. They do however represent taxa that are normally separable from one another.

A. mellifera occurs in Arabia, in northern and eastern Africa from Egypt to Tanganyika Territory, and also in Angola. *A. detinens* extends from South Africa to South-West Africa, Northern Rhodesia and Tanganyika Territory. Their ranges thus for the most part do not appear to overlap each other, except in Tanganyika Territory. In the northern and central parts of the latter and southernmost Kenya specimens have been collected combining in various degrees the characters of *A. detinens* and *A. mellifera*. It would seem that here the two taxa meet and that they freely interbreed, so that much Tanganyika material cannot be referred confidently to one or the other.

The characters separating *A. detinens* and *A. mellifera* are at best not of great significance, and in view of their behaviour in East Africa, it would seem preferable to consider the two as usually vicarious subspecies of a single species, for which the name *A. mellifera* (Vahl) Benth. must take precedence.

Acacia mellifera (Vahl) Benth.

subsp. **mellifera**

Pinnæ normally in two pairs. Racemes \pm elongate, their 0.4-1.3 cm. long peduncles usually shorter than the 5-35 mm. long axes.

subsp. **detinens** (Vahl) Brenan, subsp. et comb. nov.

Acacia detinens Burch., Trav. 1, 310 (1822).

Pinnæ normally in three, very rarely four pairs. Racemes very short or subglobose, their 0.4-1.1 cm. long peduncles normally longer than the very short (1.5-6.5 mm. long) rhachis.

The relative constancy of the characters of the two subspecies, and the way in which they become mixed in the Tanganyika and Kenya intermediates, can be seen in the following table, drawn up from a number of specimens in the Kew Herbarium :—

Name	Territory	Specimen	Indumentum on			Number of pinnae	Pairs of leaflets per pinna	Peduncle longer than (\wedge) or shorter than (\vee) inflorescence-axis
			twigs	leaf- rachis	leaf- lets			
A ACACIA MELLIFERA subsp. MELLIFERA	A.-E. Sudan	<i>Schweinfurth</i> 1933	—	—	—	2	1	<
	"	<i>Schweinfurth</i> <i>Ser. II</i> , 91	—	—	—	2	1	<
	Somaliland	<i>Collenette</i> 22	+	+	+	2	1	<
	"	<i>Collenette</i> 29	—	—	+	2	1	<
	"	<i>Gillett</i> 4083	+	+	+	2	1-2	<
	Eritrea	<i>Bally</i> 7043	—	—	—	2	1	=†
	Uganda	<i>Thomas</i> 3084	—	—	+	2	1	<
	"	<i>Eggeling</i> 2511	—	—	+	2	1	<
	Kenya	<i>Bally</i> 5663	—	—	+	2	1	<
	"	<i>Gillett</i> 13731	—	—	+	2	1	<
	"	<i>Napier</i> 61	—	—	—	2	1	<
	Tanganyika	<i>Greenway</i> 2071	—	—	—	2	1-2	<
	"	<i>Peter</i> 41677	—	—	—	2	1	<
	"	<i>Hughes</i> 130	—	—	—	2	1-2	<
B INTER- MEDIATES	Kenya	<i>Graham</i> 1622	—	—	—	2-3	1-2	<
	Tanganyika	<i>Hornby</i> 879	—	—	—	2-3	1-2	> to =
	"	<i>Michelmores</i> 929	—	—	—	2-3	1-2	=
	"	<i>Greenway</i> 6495	—	—	—	2-3	1-2	< or ? =
	"	<i>Trapnell</i> 2207	—	—	—	2-3	1-2	< or =
	Tanganyika	<i>Doggett</i> 126	—	—	—	3	1	>
C ACACIA MELLIFERA subsp. DETINENS	N. Rhodesia	<i>Rea</i> 101	+	+	±	(2-3)	1-2	>
	"	<i>Michelmores</i> 628	—	—	—	3	1	>
	S.W. Africa	<i>Rogers</i> 29673	+	+	±	3	1-2	>
	"	<i>Keet</i> 1690	+	+	±	?	1-2	>
	"	<i>Pearson</i> 9120	+	+	±	3	(1-) 2	>
	"	<i>Pearson</i> 9599	+	+	±	3	1-2 (-3)	>
	"	<i>Pearson</i> 8316	+	+	+	3	1-2	>
	Bechuana- land	<i>Lugard</i> 13	+	+	+	3	1-2	>
	"	<i>Burchell</i> 2266	+	+	+	3	1	>
	"	<i>Hilary &</i> <i>Robertson</i> 535	+	+	+	3(-4)	1-2	?
	South Africa	<i>Burchell</i> 1628 (type of <i>A. detinens</i>)	+	+	+	3	1	>

† An exceptionally reduced form.

Acacia campylacantha Hochst. ex A. Rich.

This plant belongs to a complex of closely related species ranging from South Africa through tropical Africa to India, the difficulties of disentangling which were noted by Bentham in Trans. Linn. Soc. **30**, 519 (1875). Different authors have adopted four different views on the taxonomic status of *A. campylacantha*, and in connection with the Flora of Tropical East Africa it has become necessary to assess and choose between them ; the views are as follows :—

(1) That *A. campylacantha* is a separate and distinct species. Adopted by, e.g., Hutchinson & Dalziel, Fl. W. Trop. Afr. **1**, 361 (1928) and Baker fil., Leg. Trop. Afr. 831 (1930).

(2) That it is the same as *A. catechu* (L.f.) Willd., an Indian species. Adopted by, e.g., Oliver in Fl. Trop. Afr. **2**, 344 (1871).

(3) That it is the same as *A. suma* (Roxb.) Buch.-Ham. ex Voigt, another Indian species. Adopted by, e.g., Bentham in Trans. Linn. Soc. **30**, 519 (1875).

(4) That it is a variety of *A. caffra* (Thunb.) Willd. Adopted by, e.g. Aubréville, Fl. Forest. Soudano-Guin. 272 (1950) (who also considered *A. catechu* as a synonym of *A. caffra*), by Gilbert & Boutique in Fl. Congo Belge **3**, 150 (1952) and Cufodontis in Bull. Jard. Bot. Brux. **24**, 189 (1954).

Roberty, in Candollea **11**, 157 (1948) makes *campylacantha* a variety of subsp. *suma*, which he placed under *A. catechu*.

It is convenient to consider first the connection of *A. campylacantha* and *A. caffra*. It appears to have been overlooked by those who have followed Aubréville's view (see above) that he included *A. catechu* as well as *A. campylacantha* under *A. caffra*, and that he should therefore have adopted *A. catechu* as the name for the combined species, since that epithet is the earliest.

A. caffra is certainly closely related to *A. campylacantha*, and their comparison is not made easier by the fact that *A. caffra* is polymorphic, having a wide range in South Africa from southern Cape Province to the Transvaal. Comparison of the two species leads me to the conclusion that they should be maintained as such, and the following table may be useful :—

<i>A. caffra</i>	<i>A. campylacantha</i>
Leaflets usually with lateral nerves \pm apparent and prominulous, though usually not so in Cape Province, where, however, the number of pinnae is much fewer than in <i>A. campylacantha</i> .	Leaflets with the midrib only prominulous, the lateral nerves (except sometimes a short basal one) not visible.
Leaflets usually less auriculate than in <i>A. campylacantha</i> , usually broadest at or near middle, or parallel-sided.	Leaflets conspicuously rounded-auriculate on proximal side at base, usually broadest at or near base.
Glands on petiole small, $0.75-1.5 \times 0.5-0.7$ mm.	Glands on petiole large, $2-4 \times 1.75-3$ mm.

Glands on rhachis small, 0.5–0.7 mm. in diameter, rarely as much as 1 mm. Glands on rhachis large, 1–1.75 mm. in diameter, rarely as small as 0.75 mm.

Pods narrow, 0.9–1.3 cm. wide. Pods broader, 1.2–2.0 cm. wide, less finely venose than in *A. caffra*.

Of the above characters the difference in size of the glands between the two species is particularly significant and constant. Very often *A. caffra* has fewer pinnae than in *A. campylacantha*, but in *A. caffra* var. *tomentosa*, which is found especially in Natal and the Transvaal, they may be as numerous. The leaflets of *A. campylacantha* are very uniform in their appearance, while those of *A. caffra* vary, especially from region to region.

A. catechu and *A. suma*, the other two species under which *A. campylacantha* has been put, have themselves been confused by botanists working on the flora of India, but their limits have been clarified by Prain in Journ. Asiat. Soc. **66**, 508 (1897). Prain separates them as follows :—

Bark white, calyx downy, not much shorter than petals . . . *A. suma*

Bark brown, calyx less than half as long as petals . . . *A. catechu*

In addition to these characters, *A. suma* is separable by its almost white flowers and its prickles being straight or nearly so—they are not hooked as stated in Fl. Brit. Ind. **2**, 294 (1878). That Prain's conception of *A. suma* is correct is proved by Roxburgh's excellent painting of *A. suma* (no. 1867) preserved in the Kew Herbarium, presumably portraying type or at any rate authentic material. *A. catechu* is based on *Mimosa catechu* L.f. the earliest binomial of the complex, in the original description of which the mention of "spinis stipularibus . . . recurvis" and "spicis . . . luteis" indicates that the plant referred to cannot be *A. suma*.

Accepting the above definitions, I consider that *A. campylacantha* is specifically distinct from *A. catechu* by its longer calyx—longer also in proportion to the corolla—and by its white to cream flowers; also, while the bark of *A. campylacantha* is somewhat variable (white to yellowish or grey), it does not seem to be ever brown. This disposes of the second view cited above.

The wide range of specimens from India of *A. suma* shows that its relationship with *A. campylacantha* is an extremely close one. In fact in all ways, including the very characteristic leaflets, bar only the prickles, *A. suma* and *A. campylacantha* appear to be identical. The size and colour of the prickles of the two are the same, but in *A. suma* they are straight or nearly so, their points spreading or pointing slightly upwards, while in *A. campylacantha* they are more or less hooked, their points curved downwards. In *A. suma* the prickles sometimes show slight curvature, and occasional prickles of *A. campylacantha* are only faintly hooked. In *A. campylacantha* the prickles characteristically persist and become woody bosses on the trunk; it is of interest that Kurz, Fl. Brit. Burma **1**, 421 (1877) notes the same thing in *A. suma* ("Stem . . . armed with occasional woody tubercles terminated by a prickle. . . ."). The two are indeed separable, but only by a single character, and I therefore consider that *A. campylacantha* should be sunk as a subspecies under the species

hitherto called *A. suma*, thus in the main supporting Bentham's view expressed in 1875. Again and again one marvels at the wisdom and sound judgment that inform Bentham's work on *Mimosoideae*, work often done with material that by present-day standards would seem sadly inadequate.

Unfortunately, however, *Mimosa suma* does not give the earliest epithet for the species, *Acacia suma*. The authorities at Berlin, to whom I am very grateful, have kindly sent a photograph of the type-specimen in the Willdenow Herbarium of *Acacia polyacantha* Willd., together with some actual detached leaflets and flowers : these leave no doubt that *Acacia suma* and *A. polyacantha* are conspecific, and as the latter name is earlier than *Mimosa suma* it must be adopted.

***Acacia polyacantha* Willd., Sp. Pl. 4, 1079 (1806).**

Mimosa suma Roxb., Fl. Ind. 2, 563 (1832).

Acacia suma (Roxb.) Buch.-Ham. ex Voigt, Hort. Suburb. Calcutt. 260 (1845).

subsp. ***polyacantha*.**

Aculei recti vel fere recti, apice patentés vel paulum sursum adversi. Habitat in India fortasse necnon Zeylanía.

subsp. ***campylacantha* (Hochst. ex A. Rich.) Brenan**, subsp. et comb. nov.

Acacia campylacantha Hochst. ex A. Rich., Tent. Fl. Abyss. 1, 242 (1847).

Acacia erythrantha Steud. ex A. Rich., Tent. Fl. Abyss. 1, 243 (1847).

[*Acacia catechu* (non (L.f.) Willd.)—Oliv. in Fl. Trop. Afr. 2, 344 (1871)].

[*Acacia suma* (non sensu stricto)—Benth. in Trans. Linn. Soc. 30, 519 (1875), pro parte ; et auct. al., e.g. Harms in Notizbl. Bot. Gart. Berlin 4, 210 (1906) ; Broun & Massey, Fl. Sudan, 172 (1929)].

Acacia caffra (Thunb.) Willd. var. *campylacantha* (Hochst. ex A. Rich.) Aubrév., Fl. Forest. Soudano-Guin. 272 (1950) ; Gilbert & Boutique in Fl. Congo Belge 3, 150 (1952) ; Cufodontis in Bull. Jard. Bot. Brux. 24, 189 (1954).

Acacia catechu (L.f.) Willd. subsp. *suma* (Roxb.) Roberty var. *campylacantha* (Hochst. ex A. Rich.) Roberty in Candollea 11, 157 (1948).

Aculei curvati vel uncinati, apice deorsum adversi. Habitat in Africa.

Acacia suma is often attributed to Buch.-Ham., in Wallich Catalogue No. 5227 C, but the name is here bare, without any description or indication of basynym ; or else to Kurz ex Brandis, For. Fl. N.-W. & Centr. India, 187 (1874), where the combination is correctly made, but much later than that of Voigt, cited above.

***Acacia tanganyikensis* Brenan**, sp. nov. ; inter species floribus spicatis *A. polyacanthae* Willd. subsp. *campylacanthae* (Hochst. ex A. Rich.) Brenan et praeterea *A. fleckii* Schinz et *A. mellei* Verdoorn affinis ; a his tribus differt inflorescentiis saepissime praecocibus in ramulis aphyllis

aggregatis, calycibus glabris vel tantum superne pilis saepius paucis indutis, corollis calyces subaequantibus vel quam ei parum longioribus ; insuper ab *A. polyacantha* subsp. *campylacantha* glandula petiolari parva 0.8–1.5 mm. diametro et leguminibus latoribus, ab *A. fleckii* ramulis rimosis obscure griseis et rhachidibus foliorum superne glandulosis, ab *A. mellei* lobis corollae extra glabris et leguminibus subglandulosis distinguenda.

Arbor parva vel mediocris usque ad 5.5–15 m. alta, decidua, trunco obscure griseo corrugato, vertice complanato ; ramuli juveniles pilis griseis patulis 0.25–0.5 mm. longis dense pubescentes, glandulis minimis rubentibus vel nigrescentibus inter pilos crebre immixtis ; ramuli serius epidermide obscure griseo longitudinaliter rimoso tunc inconspicue desquamante et corticem obscure griseum vel griseo-brunneum glabratum et lenticellosum detegente. *Aculei* infrastipulares, geminati, uncinati, brunnei vel grisei, usque ad 5–6 mm. longi. *Stipulae* (a *Michelmores* 816 descriptae) 2 mm. longae, lineares, pubescentes. *Folia* petiolo 5–10 mm. longo, glandula crateriformi pubescenti supra ornato, velut rhachis folii 2.8–6 cm. longus et ii pinnarum 6–17-jugarum dense pubescenti ; rhachis folii inter imo necnon inter 2–6 superiora paria pinnarum glandulas praebens ; foliola cujusque pinnae 19–32-juga, lineari-oblonga, 2.5–3.5 mm. longa, 0.6–1.0 mm. lata, apice obtusa, margine ciliata, in paginis glabra, costa supra basim unilateraliter auriculatam subcentrali, nervis lateralibus haud cernendis. *Flores* albi vel ochroleuci, saepius praecoces, spicati ; spicae in ramulis lateralibus aphyllis abbreviatis racemosim aggregatae, 5–11 cm. longae, 0.5–1.5 cm. pedunculatae, pedunculis axibusque more ramulorum juvenilium vestitis. *Calyx* campanulatus, 1.5–2 mm. longus, glaber vel praesertim superne pilis saepius paucis raro numerosis indutus, quinquelobatus, lobis saepe irregularibus 0.5–1 mm. longis. *Corolla* campanulata, calycem subaequans vel parum longior, 1.75–2.25 mm. longa, extra glabra, quinquelobata, lobis 0.75 mm. longis. *Stamina* numerosa (circ. 117), filamentis liberis 5–5.5 mm. longis, antheris circiter 0.2 mm. latis, apice glandula caduca coronatis. *Ovarium* glabrum, circiter 0.75 mm. longum, 0.4 mm. latum, stipite circiter 0.3 mm. longo suffultum. *Legumina* oblonga, recta vel subrecta, 8–21 cm. longa, 1.6–2.6 cm. lata, basi stipitata, apice breviter acuminata, puberula, venosa. *Semina* (a *Michelmores* 816 descripta) circiter 11–13 mm. diametro.

TANGANYIKA. Mwanza District : 16 km. S.W. of Karumo, 1190 m., July 1951, *Eggeling* 6258 (K, FHO) :—tree 9 m. high, flat-topped ; bole gnarled, dark grey, corrugated ; flowers in spikes, whitish-yellow, fading orange-brown ; no stipular spines ; prickles paired, hooked, below leaves ; foliage grey-green ; immature pods pale green, downy. Shinyanga District. In the Nindo bush, 1160 m., 9 July 1937, *B. D. Burt* 6427 (K, holotypus, BM, isotypus) :—in hard-pan country ; tree 7.5–12 m. high, now covered with white flowers, very common. Shinyanga, 1220 m., Sept. 1948, *P. B. Kemp* 8 (BM). Singida District : S.W. of Ndindindi, 1220 m., 1 July 1933, *B. D. Burt* 4453 (K, BM) :—tree to 15 m. or more, with fluted trunk ; flowers when tree is leafless ; vernacular name (Kinyamwezi) “mgongwa”. Kizaga–Usule, 14 Dec. 1933, *Michelmores* 816 :—fair-sized tree ; fallen pods. Kondo District : Sambala, 1490 m., 27 Aug. 1929, *B. D. Burt* 2168 (K, BM) :—dominant

in semi-seasonal swamp with *Commiphora schimperi*, *Coleus igniarius* and Capparidaceous plants; tall tree to 10.5 m., flat-crowned. Same locality, 23 Apr. 1929, *B. D. Burtt* 2169 (K, BM) :—tall semi-flat-topped tree growing scattered through *Berlinia-Brachystegia* hills, probably indicating underground drainage. Same locality, 1490 m., 27 Aug. 1929, *B. D. Burtt* 2170 (K, BM) :—tall tree locally common; flowers come before leaves; poles used for building, very hard wood. Same locality 1500 m., 25 Sept. 1929, *B. D. Burtt* 1781 (K, BM) :—fruits from large tree. Probably Kilimatinde or Ugogo, July–Aug. 1900, *Busse* 249 (K, BM) ? Dodoña or Mpwapwa District : Dodoma–Iringa road, 1 Oct. 1951, *Hughes* 123 :—tree 5.5 m. high, 22 cm. diam.; bole 2.7 m., straight, cylindrical; flowers yellow; fairly common in this area. ? District. Tabora, Kahama, Igombe etc., widespread and common, 1070–1220 m., Apr.–July 1935, *Lindeman* 154 (BM).

The stipules and seeds are described above from *Michelmores* 816, which is a poor, incomplete specimen, of whose identification I am not fully certain.

A. tanganyikensis has in the past been misidentified with *A. rosumae* Oliv., which is a coastal species growing at low elevations, having broader leaflets than *A. tanganyikensis* more than 1 mm. wide, the corollas projecting beyond the calyces for a length at least $\frac{1}{2}$ that of the latter, spikes produced at the same time as the new leaves, and usually a yellowish curled indumentum on the young parts.

In fact, *A. tanganyikensis* is more closely related to certain other species, notably *A. polyacantha* subsp. *campylacantha*, *A. fleckii* Schinz*, and *A. mellei* Verdoorn, than it is to *A. rosumae*. The following table shows how these are distinguished :—

<i>A. tanganyikensis</i>	<i>A. polyacantha</i> subsp. <i>campylacantha</i>	<i>A. fleckii</i>	<i>A. mellei</i>
Twigs rather rough with fissuring and flaky bark, deep dull grey	Twigs rather smooth, mostly grey	Twigs rather smooth, pale grey to grey-brown	Twigs somewhat roughened with lenticels, deep dull grey-purplish-brown
Gland on petiole small or medium, 0.8–1.5 mm. in diam.	Gland on petiole large, 2–4 × 1.75–3 mm.	Gland on petiole small to medium, 0.5–1.75 mm. long	Gland on petiole small or absent, to 1 mm. in diam.
Leaf-rhachis glandular above	Leaf-rhachis glandular above	Leaf-rhachis eglandular	Leaf-rhachis glandular above
Flowers normally precocious, before the leaves	Flowers with the new leaves	Flowers with the new leaves	Flowers with the new leaves

* *Acacia fleckii* Schinz in Mém. Herb. Boiss. **1**, 108 (1900); Bak. f., Leg. Trop. Afr. 832 (1930).

Acacia cinerea Schinz in Verh. Bot. Ver. Brandenburg, **30**, 240 (1888); Bak. f., Leg. Trop. Afr. 832 (1930); non *Acacia cinerea* Spreng., Syst. Veg. **3**, 143 (1826).

The holotype of *Acacia cinerea* Schinz is Schinz 252, Omatope, Amboland, South-West Africa. I have examined this specimen, which was courteously lent by the Director of the Botanischer Garten und Botanisches Museum der Universität Zürich, whom I must thank. I have also, through the kindness of Mr. A. W. Exell, been enabled to examine the holotype of *A. fleckii*, Fleck 412a, which was on loan to the British Museum (Natural History).

<i>A. tanganyikensis</i>	<i>A. polyacantha</i> subsp. <i>camphylantha</i>	<i>A. fleckii</i>	<i>A. mellei</i>
Calyx glabrous or with a few hairs especially above, rarely hairs rather numerous	Calyx pubescent or puberulous all over, rarely puberulous on lobes only	Calyx pubescent or puberulous all over or subglabrous	Calyx pubescent or puberulous all over
Corolla equalling or slightly longer than calyx	Corolla $1\frac{1}{2}$ or more the length of the calyx	Corolla $1\frac{1}{2}$ or more the length of the calyx	Corolla $1\frac{1}{2}$ or more the length of the calyx
Corolla-lobes glabrous outside	Corolla-lobes glabrous outside	Corolla-lobes glabrous or slightly puberulous outside	Corolla-lobes puberulous outside
Pods 2-2.6 cm. wide, downy or puberulous, glands few or none	Pods 1.2-2 cm. wide, glabrous or nearly so	Pods 1.4-2 cm. wide, puberulous to subglabrous, with \pm numerous reddish glands	Pods 1.2-2.0 (-2.2) cm. wide, pubescent or puberulous, with many dark blackish-red glands

***Acacia goetzei* Harms** in Engl., Bot. Jahrb. **28**, 395 (1900).

This seems the correct name for one of the taxonomically most perplexing complexes among the spicate-flowered acacias of tropical Africa.

The name *A. mossambicensis* Bolle in Peters, Reise Mossamb. Bot. 5 (1861) has been applied to the complex, but in my view certainly incorrectly. Before discussing *A. goetzei* in more detail, the reasons for rejecting *A. mossambicensis* should be given.

Oliver in Fl. Trop. Afr. **2**, 339 (1871) included *A. mossambicensis*, with some doubt, under *A. albida* Del. ; with this conclusion I entirely agree. Indeed Bolle himself compared *A. mossambicensis* with *Acacia albida*, remarking that the former differed in its spinelessness and pubescence, both characters that can be seen in specimens of *A. albida* from Portuguese East Africa, the territory in which the type of *A. mossambicensis* was collected ; Bolle also compared his new species with *A. saccharata* Benth., nowadays likewise considered to be a synonym of *A. albida*.

Unfortunately, Oliver in October 1867 compared with the original specimen of *A. mossambicensis* a specimen of *Acacia* collected by Kirk in the Maravi country W. of Lake Nyasa. Oliver noted in pencil on the sheet of this specimen (now in the Kew Herbarium) that he had made the comparison, added a sketch of a pod, presumably from the type of *A. mossambicensis*, and significantly noted "*A. mossambicensis* Bolle I refer to *A. albida* Del." Kirk's specimen compared by Oliver is, however, certainly not *A. albida*, but *A. goetzei* for which, following Oliver's comparison, the name *A. mossambicensis* has been commonly used, e.g. by Baker fil., Leg. Trop. Afr. 831 (1930).

There are strong reasons for disbelieving that Kirk's specimen and the plant described by Bolle are conspecific. A comparison between the two shows important discrepancies :—

<i>Bolle's description</i>	<i>Kirk's specimen</i>
Rinde weissgrau	Branchlets blackish-purple

Hauptblattstielen . . . am gemeinsamen Ursprunge von je 2 Fiedern eine concave, dunkelbraune Drüse mit gelbem Rande darbieten	Rhachis, as far as can be seen, eglandular.
Blättchen von zwei beinahe gleich starken Nerven durchzogen	Leaflets with a single midrib
Kelch rauh behaart	Calyx glabrous
Blumenkrone . . . sehr tief getheilt	Corolla not especially deeply lobed

In addition Bolle's description of the pods is altogether at variance with those produced by the species represented by Kirk's specimen. In all these points, and elsewhere, Bolle's description well fits the pubescent variant of *Acacia albida*, which is found in Portuguese East Africa, and is represented in the Kew Herbarium by *Torre* 6581 and *Barbosa* 2227, both collected in that territory.

In addition to *A. goetzei* and the misapplication of *A. mossambicensis*, the following species evidently fall into this complex: *A. ulugurensis* Taub. ex Harms, *A. bequaertii* De Wild., *A. kinionge* De Wild., *A. joachimii* Harms, *A. van-meelii* Gilbert et Boutique. I am very grateful to Prof. Dr. W. Robyns through whose courtesy I have been enabled to see types or isotypes of *A. joachimii* and *A. van-meelii* from the Herbarium of the Jardin Botanique de l'État at Brussels.

Forms of *A. goetzei* (taken in a wide sense) with small leaflets may show much resemblance to *A. roovumae* Oliv., but the latter species is perfectly distinct from *A. goetzei* in its straight or only slightly curved (not strongly hooked) prickles, in its puberulous not glabrous calyces, and in its inhabiting riverine forest or salt-water swamp-forest. *A. burkei* Benth. may also be distinguished from *A. goetzei* by its hairy calyces.

Some account of the variability of *A. goetzei* must now be given. The paired, hooked prickles on the stems and the individual flowers are uniform; the indumentum, the glands and armature of the leaf-rhachis, the number of pinnae and the leaflets, the size and shape of the leaflets, and the length of the inflorescence-axes all vary within more or less wide limits. The extremes of the complex look so very different that to put them in the same species seems outrageous; yet when the whole range of variation is inspected, it is hard to divide it satisfactorily. Attempts to use the variable characters mentioned above to subdivide *A. goetzei* have proved failures, except when the width of the leaflets was taken as a primary criterion. On this basis *A. goetzei* can be split fairly satisfactorily into two taxa. Unfortunately, however, these two taxa show no other absolute distinctions from each other, although each shows certain significant tendencies. After much hesitation, I have decided to maintain these two taxa as subspecies, although they are anything but homogeneous within themselves. It may well be that two originally distinct species have crossed so freely with each other and possibly with further species, a process perhaps assisted by past ecological changes in East Africa, that their distinctness has become blurred by introgression. The following are the two taxa:—

TABLE I. VARIATION WITHIN *ACACIA GOETZEI*

Territory	Collector and number of specimen	Locality and date	Indumentum of young stems, leaf-rhachides and inflorescence-axes
Kenya	Graham 2273	Embu District, 12.10.1932	Glabrous
Tanganyika Territory	Goetze 387	Kilosa District, Kidadi, 1898	Glabrous
"	Burt 5626	Shinyanga, Mar. 1936	Thinly hairy
"	Koritschoner 3050	Shinyanga	"
"	Burt 5565	Shinyanga, 2.3.1937	Glabrous
"	Burt 1947	Kondoa District, Sambala, 11.3.1929	Glabrous
Portuguese East Africa	Mendonça 2297	Malema, Mutuali, 28.9.1944	Puberulous
"	Torre 5809	Between Zobue and Muatize, 27.8.1943	Glabrous
"	Torre 3455	Between Mocuba and Munhamede, 23.9.1941	Pubescent
"	Kirk s.n.	Maravi country, W. of L. Nyasa, without date	Pubescent
Nyasaland	Meller s.n.	Manganja Hills, Sept.-Oct. 1861	Glabrous
"	Topham 847	Limbe, without date	Puberulous
"	Buchanan 574	Without locality, 1891	Pubescent
Northern Rhodesia	Sandwith 57	Between Quien Sabe and old Argosy mines, 12.10.1929	Pubescent
"	Milne-Redhead 1230	Mazabuka District 8.10.1930	Pubescent
"	Stevenson 129/30	Mazabuka, Chifumpu road, 19.10.1930	Pubescent
Southern Rhodesia	Whellan S.R.G.H. 25803	Urungwe, Chipani, 2.11.1949	Glabrous
Angola	Gossweiler 9606	Kela, 19.12.1930	Glabrous

* A + means presence of a gland, 0 means absence. The three positions, reading from left to right,

SUBSP. *GOETZEI*

Armature of leaf-rhachis	*Glands on petiole and leaf-rhachis. Base→apex	No. of pairs of pinnae	No. of pairs of leaflets	Dimensions of leaflets, in mm.	Indumentum of leaflets	Length of inflorescence-axes, in cm.
Unarmed	+...0...+	3-6	6-8	6-17 × 3-10	Glabrous except at base	4-7
Very prickly	+...0...+	3-4	5-6	6-13 × 4-7	Glabrous except at base	6-8
Unarmed	+...0...0	3-4	3-4	5-17 × 3-5-12-5	Glabrous	?
Unarmed	{+...0...0 +...0...+	4-5	6-8	7-17 × 4-9	Glabrous	?
Unarmed	?	4-5	5-7	7-14 × 3-5-8	Glabrous	?
Prickly or not	+...0...0	3	2-4	7-20 × 4-12	Glabrous	?
Unarmed	+...0...+	5-6	8-10	6-12-5 × 4-6	Glabrous except at base	3-5-5
Unarmed	+...0...+	6	8-11	5-12 × 3-4-5	Glabrous except at base	3-5-7
Unarmed	{0...+...++ 0...+...++ +...0...+	6-8	9-14	5-11 × 2-25-4	Pubescent	About 3-5
Unarmed	+...0...+	4-5	8-11	6-10 × 2-5-4	Pubescent	8
Unarmed	{+...0...+ +...0...++	5-9	8-10	6-11 × 2-75-3-5	Subglabrous	3-4-5
Unarmed	{+...+...+ +...0...+	6-7	8-11	6-5-12 × 3-5-5	Glabrous except at base	6-12
Unarmed	+...0...+	4-5	8-11	7-13 × 3-6	Pubescent	3-6
Unarmed or slightly prickly	+...0...+	4-5	7-9	7-13 × 3-4	Subglabrous	6-7
Unarmed	{+...0...0 +...0...+	4-5	7-9	6-15 × 2-5-6	Pubescent	4-5-8
Unarmed	+...0...+	4-5	8-10	7-14 × 3-6	Thinly pubescent	7-10
Unarmed	+...0...+	5	8-10	7-13 × 3-7	Glabrous	c. 4-7-5
Unarmed	{+...0...++ +...0...+++	4-8	13-17	6-12 × 2-5-6	Glabrous except at base	About 6-5

are petiole, basal pair or pairs of pinnae, and apical ones.

TABLE II. VARIATION WITHIN *ACACIA GOETZEI*

Territory	Collector and number of specimen	Locality and date	Indumentum of young stems, leaf-rhachides and inflorescence-axes
Kenya	Gillett 12668	Moyale, 1.4.1952	Pubescent
Tanganyika	Semsei F.H. 2925	Kangata, Nov. 1949	Thinly puberulous
"	Bruce 49	Uluguru Mts., Nov.	Thinly puberulous to pubescent
"	Micheltore 923	Morogoro District, Melela, 12.1.1934	Glabrous to thinly pubescent
"	Schlieben 3098	Uluguru Mts., 12.12.1932	Glabrous to thinly pubescent
"	Semsei F. H. (2117) 69	Masasi District, Kilimarondo	Glabrous
Portuguese East Africa	Andrada 1463	Nampula, nr. the R. Napinini, 14.11.1948	Thinly puberulous
"	Torre 4725	Between Pebane and Mualama, 30.10.1942	Puberulous
"	Andrada 1302	Between Ancuabe and Montepuez, 25.8.1948	Thinly puberulous to pubescent
"	Faulkner (Kew) 99	Namagoa, Oct. 1946	Puberulous to shortly pubescent
"	Torre 3597	Between Altomolocué and Lugela, 6.10.1941	Shortly pubescent
"	Faulkner (Kew) 306 (1)	Namagoa, 20.10.1948	Puberulous
"	Andrada 1445	Mandimba, 24.10.1948	Subglabrous
Nyasaland	Greenway 6367	Chitala to Dowa, 28.10.1941	Glabrous
"	Greenway 6393	Njakwa to Fort Hill, 3.11.1941	Glabrous
Southern Rhodesia	Eyles 4049	Umtali, Nov. 1924	Glabrous
"	Wild S.R.G.H. 15451	Miami District, 4.10.1946	Glabrous
Northern Rhodesia	Micheltore 607	R. Mwunyamazi, 29.9.1933	Glabrous

* A + means presence of a gland, 0 means absence. The three positions, reading from left to right,

SUBSP. *MICROPHYLLA*

Armature of leaf-rhachis	*Glands on petiole and leaf-rhachis. Base → apex	No. of pairs of pinnae	No. of pairs of leaflets	Dimensions of leaflets, in mm.	Indumentum of leaflets	Length of inflorescence-axes, in cm.
Unarmed	+ . . . 0 . . . + +	6-8	15-23	3-8 × 1.25-2	Puberulous on margins and at base	6-8
Prickly or not	+ . . . 0 . . . + + +	4-9	8-13	3.5-8 × 1.25-3	Sparsely puberulous	3-4
Prickly or not	+ . . . 0 . . . +	(3-) 6-7	9-17	4.5-7 × 1.5-2.5	Pubescent	6-8
Very prickly	+ . . . 0 . . . +	5-6	9-12	2-8.5 × 1-2.5	Subglabrous except often for base	4-5
Prickly	+ . . . + . . . +	6-7	11-14	3-6 × 1.5-2	Thinly pubescent, hairy at base	About 5
Prickly	+ . . . 0 . . . +	4-5	11-13	2.5-8 × 1.5-2.5	Glabrous except sometimes at base	?
Very prickly	{ + . . . 0 . . . + + + + . . . 0 . . . +	5-6	10-13	3.5-6 × 0.75-1.5	Thinly puberulous hairy at base	4-5.5
Prickly or not	+ . . . + . . . + + +	7-10	18-22	3-6.5 × 1.25-1.5	Puberulous on margins and at base	2-4
Unarmed or sometimes prickly	{ + . . . + . . . + + + . . . 0 . . . +	6-9	14-20	3-6 × 1.25-2	Puberulous on margins and hairy at base	4-5
Very prickly	{ + . . . 0 . . . + + . . . 0 . . . + +	5-8	9-14	3-6 × 1-2.5	Puberulous on margins, hairy at base	4-5
Unarmed	{ + . . . + . . . + + + . . . + . . . + + + + . . . + . . . (+) . . . + + + + . . . + . . . + + + + +	5-9	10-19	4-7 × 1.25-2.5	Puberulous	4-4.5
Prickly	{ + . . . + . . . + + + . . . 0 . . . +	4-5	8-9	4-6.5 × 1.25-1.75	Subglabrous or puberulous, hairy at base	3-4
Unarmed	{ + . . . 0 . . . + + . . . 0 . . . + +	6-9	10-20	4-8.5 × 1.5-2.25	Subglabrous, hairy at base	About 6
Unarmed	+ . . . 0 . . . +	3-9	12-18	4-9 × 1.5-2 (-3)	Glabrous, except hairy base	6-8
Unarmed	{ + . . . 0 . . . + + . . . 0 . . . + +	5-7	10-16	4-9 × 1.5-3	Glabrous, except hairy base	4-6
Prickly	{ + . . . 0 . . . + 0 . . . 0 . . . +	4-5	8-13	5-8 × 1.5-2.5	Glabrous or hairy at base only	About 5
Unarmed	{ + . . . 0 . . . + + . . . 0 . . . + +	6-8	15-22	5-10 × 2-2.5	Glabrous or slightly hairy at base	3.5-10
Prickly	{ 0 . . . + . . . + 0 . . . + . . . + +	5-6	10-16	3-7 × 1-1.75	Subglabrous, hairy at base	2-3

are petiole, basal pair or pairs of pinnae, and apical ones.

***Acacia goetzei* Harms subsp. *goetzei*.**

[*A. albida* (non Del.) —Oliv. in Fl. Trop. Afr. **2**, 339 (1871), *pro parte, quoad syn. A. mossambicensis*].

A. sp. nov. ? Oliv. in Fl. Trop. Afr. **2**, 353 (1871).

A. goetzei Harms in Engl. Bot. Jahrb. **28**, 395 (1900), *sensu stricto* ; Baker f., Leg. Trop. Afr. 830 (1930), *pro parte*, excl. *Eyles* 4049 ; Brenan & Greenway, Check-Lists For. Trees & Shrubs Brit. Emp. **5** (Tang. Terr., **2**), 329 (1949) ; Bogdan in Nature in East Africa, ser. 2, no. 1, 12 (1949).

A. bequaertii De Wild. in Fedde, Repert. **11**, 501 (1913) ; Baker f., Leg. Trop. Afr. 830 (1930) ; Gilbert & Boutique in Fl. Congo Belge, **2**, 151 (1952).

[*A. mossambicensis* (non Bolle)—Baker f., Leg. Trop. Afr. 831 (1930)].

Foliola fere omnia quam 3 mm. latiora (2.5–12.5 mm. lata), saepius apicem versus latiora, hinc obovata vel obovato-oblonga vel oblanceolato-oblonga, saepius pauca, (2–) 5–11 (–14 vel rarissime usque ad 17)-juga ; rhachis saepius inermis et inter par supremum tantum pinnarum glandulam praebens.

A. goetzei subsp. *goetzei* is known from the Belgian Congo, Kenya, Tanganyika, Portuguese East Africa, Nyasaland, Northern and Southern Rhodesia, and Angola. It is separable from *A. goetzei* subsp. *microphylla* by the leaflets mostly more than 3 mm. wide (range 2.5–12.5 mm.), usually wider towards their apices than in their lower part, also by the tendencies to have fewer leaflets, unarmed leaf-rhachides, and a gland between the topmost pair of pinnae only, not between each of the upper 2–3 (–5) pairs. None of these tendencies is constant in subsp. *goetzei*, however, and all can sometimes occur in subsp. *microphylla*. A few specimens, e.g. *Trapnell* 1378 (Northern Rhodesia, Menali Pass, Jan. 1934) and *Trapnell* 2062 (Northern Rhodesia, E. of Mumbwa, 19 June 1932) it is hard to refer to either subspecies as their leaflets are intermediate in size and shape.

Robinson 253 (Northern Rhodesia, Mapanza west, 1953) and *Trapnell* 1319 (Northern Rhodesia, Mandanda, 21 Sept. 1933) have a combination of few (3–6 pairs) leaflets and dense indumentum. They probably represent a variant of subsp. *goetzei*, but I am not sure.

The variation of a number of characters within subsp. *goetzei* is shown in Table I.

***Acacia goetzei* Harms subsp. *microphylla* Brenan, subsp. nov.**

A. ulugurensis Taub. ex Harms in Engl. Bot. Jahrb. **28**, 396 (1900) ; Baker f., Leg. Trop. Afr. 831 (1930) ; Brenan & Greenway, Check-Lists For. Trees & Shrubs Brit. Emp. **5** (Tang. Terr., **2**), 332 (1949).

A. kinionge De Wild., Pl. Bequaert. **3**, 60 (1925) ; Gilbert & Boutique in Fl. Congo Belge, **3**, 153 (1952).

A. joachimii Harms in Notizbl. Bot. Gart. Berl. **12**, 507 (1935) ; Brenan & Greenway Check-Lists For. Trees & Shrubs Brit. Emp. **5** (Tang. Terr. **2**), 331 (1949).

A. van-meelii Gilbert et Boutique in Bull. Jard. Bot. Brux. **22**, 177 (1952) & in Fl. Congo Belge **2**, 149 (1952).

Foliola fere omnia quam 3 mm. angustiora (0.75–3.5 mm. lata), saepius, paribus terminalibus exceptis, apicem versus haud latiora, hinc oblonga vel lineari-oblonga, saepius quam in subsp. *goetzei* numerosiora, 8–23-juga; rhachis saepius aculeata et inter paria superiora 1–3 (–5) pinnarum glandulas praebens.

Holotypus:—Nyasaland. Mombera District, Njakwa to Fort Hill, 1070 m., 3 Nov. 1941, *Greenway* 6393 (Herb. Kew.):—lightly branched, very thorny small tree up to 4.5 m. tall with spikes of cream flowers; locally common but scattered in native cultivations on a sandy brown soil in an area covered with large ant-hills, and associated with *Isoberlinia globiflora*, *Combretum*, *Vitex cuneata* and *Acacia benthamii*.

The subsp. *microphylla* is known from the Belgian Congo, Kenya, Tanganyika, Portuguese East Africa, Northern and Southern Rhodesia, and Nyasaland—in fact from the same set of territories as for subsp. *goetzei*, except for Angola.

The variation of a number of characters within subsp. *microphylla*, together with a selection of specimens additional to the holotype cited above, is shown in Table II.

Table II shows the complicated way in which certain variable characters behave. It is sometimes stated when dealing with plants showing characters of this sort that the latter vary independently; this however does not appear to express satisfactorily the present position: certain combinations of characters seem commoner than others, but these combinations may not infrequently be altered by the modification or substitution of individual characters, which do not vary quite independently, but show correlation (of varying degrees of imperfection) with other characters.

In north-central Tanganyika Territory, forms occur with unusually large leaflets in few pairs, as can be seen from Table I, possibly a local race of this region; however a plant with very similar leaves, but unfortunately sterile, has been collected at Domira Bay, Nyasaland (*B. D. Burtt* 6046); the stems of this gathering vary from glabrous to pubescent, and the leaf-rhachides from unarmed to prickly. From Table I it can be seen that pubescent forms are more numerous towards the south, being uncommon or absent in Tanganyika Territory and Kenya. In addition, the solitary Angolan gathering cited has unusually numerous leaflets. There is thus some evidence for geographical variation, but I do not at present find it feasible to recognise any clear-cut variants.

Table II shows for subsp. *microphylla* the range of variation in certain characters in the way that Table I did for subsp. *goetzei*. Certain trends are noticeable, e.g. the frequency of \pm hairy-stemmed forms in Kenya, Tanganyika and Portuguese East Africa, and their absence or rarity elsewhere, but the correlation between variation and geography is as vague as it is for subsp. *goetzei*.

TWO NAME-CHANGES FOR MALAYAN BAMBOOS.

R. E. HOLTUM

Schizostachyum gracile (Munro) Holttum, comb. nov.Basonym : *Melocanna gracilis* Munro in Trans. Linn. Soc. 26 : 133. 1868.Synonym : *Schizostachyum tenue* Gamble in Ann. R. Bot. Gard. Calc. 7 : 114, pl. 100. 1896.

The type specimen of *Melocanna gracilis* Munro is Wallich no. 5032, collected at Singapore. I have seen three sheets of this collection at Kew, and have no doubt that they represent the same species as *S. tenue* Gamble, as typified by Ridley's no. 5596 (Kuala Berar, Pahang). Gamble however placed *M. gracilis* as a synonym of *S. chilianthum*, under which name also he included specimens which I would regard as *S. zollingeri* Steud. The epithet *chilianthus* was originally given by Buse to the type species of his new genus *Chloothamnus* ; Gamble was misled by Kurz into transferring the species to *Schizostachyum*.

The three species, *S. gracile*, *S. zollingeri*, and *S. brachycladum* Kurz are closely allied and are not easy to distinguish from flowers alone, though the habit of growth of the plants, and the culm-sheaths, are distinct. I have attempted to describe the three species in a new account of the bamboos of the Malay Peninsula which I hope will soon be published in Singapore.

Bambusa montana (Ridl.) Holttum, comb. nov.Basonym : *Dinochloa montana* Ridl. in Journ. Str. Br. R. Asiat. Soc. 44 : 210. 1905.

This species is based on three collections, apparently all from the same plant, made by Ridley and Curtis on Penang Hill in December 1895, April 1896 and March 1899, nos. 7064, 7265, 10171. Specimens of the two earlier collections are to be found only in the Singapore herbarium, and bear no mature spikelets. No. 10171 is represented also in the herbaria of Kew and the British Museum, and only on the British Museum sheet is a good spikelet to be found. This spikelet I have dissected, and find that it has two perfect florets and one rudimentary floret at the apex ; the spikelet-structure is identical with that found in *Bambusa klossii* Ridl. and *B. pauciflora* Ridl., from Kedah Peak and Fraser's Hill respectively. These species, with *B. cornuta* Munro, represent a group of slender subscandent mountain bamboos which in habit are rather like *Dinochloa*. Their spikelets are reduced, as compared with the normal condition in *Bambusa* ; they are in fact intermediate between normal *Bambusa* and *Dinochloa*, and I believe that the relationship of *Dinochloa* is with *Bambusa*, not with *Schizostachyum*, near which it has traditionally been placed.

ON THE IDENTIFICATION OF THE COMMON HEDGE-BAMBOO OF SOUTH-EAST ASIA.

R. E. HOLTUM

In his Monograph of bamboos (1868) Munro used the name *Bambusa nana* Roxb. for the common hedge-bamboo of S.E. Asia, and this name was also used by Gamble in his later work on the bamboos of India. (1896). Owing to the authority of these two important works, the name *B. nana* was in common use for the species in question from 1868 until Merrill (1935) stated that the earlier name *Arundo multiplex* Lour. was given to the same species, so that the correct name should be *Bambusa multiplex* (Lour.) Raeusch. Since 1935, the name *B. multiplex* has gained some currency, but I believe that Merrill was wrong in considering Loureiro's species to be identical with *B. nana* Roxb. The matter cannot be settled by reversion to the use of Roxburgh's name, as there is an earlier name, *Ludolfia glaucescens* Willd., which Munro admitted to refer to the same species. Munro did not use the name *Bambusa glaucescens* because he followed the rule that the correct name was the first one in the right genus, not the modern rule of using the earliest specific epithet in whatever genus. I believe the correct name is *Bambusa glaucescens* (Willd.) Sieb. ex Munro, and present the evidence in the following paragraphs. (Merrill pointed out in 1912 that, admitting the identity of Willdenow's species with that of Roxburgh, the name should be *B. glaucescens*, but he did not discuss the evidence for recognizing that identity).

There is no type specimen for *Arundo multiplex* Lour. ; Merrill's identification of the species is based solely on specimens from Indo-china bearing the same vernacular name and with the information that the plants were used for making hedges. Merrill wrote (p. 83) "Messrs. Dodo and Parraut kindly secured material for me under the local name cây hóp, and this, which agrees with Loureiro's description, proves to be the species commonly known as *Bambusa nana* Roxb.", adding that the latter species is commonly planted for hedges in China and the Indo-Malaysian region (Loureiro stated that *Arundo multiplex* was so used in Cochinchina). But *Bambusa nana* differs from the description of *A. multiplex* in three distinct characters. In Loureiro's description are the words : "Folia . . . 6 pollices longa . . . glabra . . . coloris fusco-viridis." I have never seen a leaf of *B. nana* six inches (15 cm.) long ; they are often no more than 5 cm. and rarely over 12 cm. long. Their most distinctive characters are a pale glaucous and finely velvet-hairy lower surface (the upper surface also is pale, not fusco-viridis). There is nothing specifically distinctive in the other statements in Loureiro's description, all of which might apply to other species of *Bambusa*. Thus Merrill's identification of *B. nana* with *A. multiplex* is in conflict with the most distinctive parts of the description given by Loureiro, and therefore rests entirely on the statement that the vernacular name of *B. nana*, and its use for hedges, are in agreement with Loureiro's statements about *A. multiplex*.

In the account of the bamboos of Indo-china in Lecomte's Flora (Camus 1923), the vernacular name *cay hóp* is recorded for *B. tuldooides* ;

and on a specimen of that species in Kew herbarium (Balansa, *Plantes du Tonkin*, no. 1589) is the statement "Hanoi, où il sert à faire des haies". Balansa's specimen (which appears to be rightly named) has leaves which do correspond with Loureiro's description, being fully six inches long, rather dark olive-green, and only slightly hairy. The vernacular name *cai thop* is recorded by Camus for *B. nana*. A third species is also recorded as in use for hedges in Indo-china, namely *B. flexuosa*, a small thorny bamboo; this information is contained in Camus's account, and is also on a specimen from Balansa at Kew (no. 4552). Thus every part of the evidence used by Merrill to justify the replacement of the name *B. nana* by *B. multiplex* is shown to be doubtful or inaccurate.

The status of the name *B. nana* Roxb. must now be considered. The name was first published in Roxburgh's *Hortus Bengalensis* (1814), but without description; the species is recorded as having been introduced from China in 1794. In his *Flora Indica* (second edition, not published until 1832 but written much earlier) Roxburgh again gave no effective description; the entry is as follows: "7. *B. nana* R. Shrubby, unarmed. Sans. keu-fa, of the Chinese; a native of their country, and now plentiful in the Botanic Garden at Calcutta, but has not yet blossomed in Bengal. It makes most beautiful close hedges". Whether this should be regarded as a valid publication of the name *B. nana* may be open to argument; fortunately the matter does not arise, as the name *glaucescens* is earlier. The first good description of *B. nana* as such was given by Munro in 1868; that the name had long been in use for the plant described by Munro is shown by a specimen from Patna in Wallich's herbarium, dated 1812. No such tradition of use can be claimed for the name *B. multiplex*.

We now come to Willdenow's species *Ludolfia glaucescens* (1808). Munro mentioned this species under the genus *Arundinaria* on p. 22 of his Monograph; he did not give an original description, but merely quoted former authors, remarking that he had never seen a specimen, and that he did not understand Ruprecht's drawing (1839, tab. 1, fig. 3) which showed three additional ovaries in place of stamens. He also stated that he thought *L. glaucescens* to be identical with *Bambusa nana*, but had no proof. While the Monograph was going through the press, and apparently after p. 22 had been printed, Munro received specimens of *B. nana* from Ceylon having some abnormal flowers matching Ruprecht's drawing in having modified stamens (though of variable form and not all like those figured by Ruprecht; Munro states that some were very small, and some more like lodicules). Munro gave a rather long original description of *B. nana*, and then added a note that the receipt of the Ceylon specimens had convinced him of the identity of *B. nana* with *Arundinaria glaucescens*.

On p. 22, Munro (perhaps copying Ruprecht) appears to consider the name *glaucescens* to be based on Lamarck (1798, p. 749); but Lamarck used the name *Panicum arborescens* Linn., though (misinterpreting Linnaeus) he appears to have been describing the species later called *glaucescens*. This error of citation occurs also in the Index Kewensis, and has been pointed out by Merrill (1912).

The name *Ludolfia glaucescens* was published by Willdenow (1808) for a plant which flowered in a warm greenhouse in the Botanic Garden at

Berlin. Willdenow considered his species to be congeneric with *Arundinaria macrosperma* Michaux, but proposed a new generic name because he considered that the name *Arundinaria* was in conflict with a rule then accepted. He gave first a brief generic diagnosis and then a description of his new species. He stated that his plant had been in cultivation for some years under the name *Panicum arborescens*. He did not know its origin, but thought it was from "Ostindien".

Willdenow's description of the species *L. glaucescens* is consistent with *Bambusa nana*; in that description he makes no mention of stamens, but indicates three stamens in the generic diagnosis. The same description was published again in the following year, in the catalogue of plants in cultivation at Berlin.

Unfortunately Willdenow's original specimen is not now to be found in his herbarium; for this information I am indebted to the Director of the Garden and Museum at Berlin-Dahlem. In view of the following facts, however, I think there can be no doubt of the identity of Willdenow's species with the bamboo long known in India as *Bambusa nana*.

Ruprecht prepared his monograph on bamboos (1839) at Prague. He received an appointment at St. Petersburg early in 1839, and the Monograph was communicated to the Academy there on Sept. 6th of that year. (It was his first major botanical work, and he was only 25 years old at the time of its publication). He stated that the species he called *Arundinaria glaucescens* (Willd.) Beauv. was "in hortis nostris non rara" (as a greenhouse plant, but he does not say so); he also stated that he had seen living plants and had received specimens of flowers from Reichenbach (who was then at Dresden). He said nothing in his description about the additional ovaries, in place of stamens, shown in his figure.

It is strange that Ruprecht did not mention a flowering of *Ludolfia glaucescens* which apparently occurred at St. Petersburg in the spring of 1839, and was the subject of a report (in German) to the academy on Oct. 4th of that year (Fischer and Meyer 1839). Fischer and Meyer stated that as it was necessary to repair a warm greenhouse, a large old plant of *Ludolfia glaucescens* had to be moved, and in the autumn (of 1838?) it was divided into several pieces which were put into pots. The following spring these plants all put up new shoots which bore flowers. The flowers were peculiar, having no stamens; in place of the stamens were a varying number of carpel-like objects, the outer ones more like lodicules, the inner ones each bearing a stigma but having no cavity which could contain an ovule. The description of the inner carpel-like structures agrees with the figure published by Ruprecht; but Ruprecht only shows three of these additional carpels. Possibly Ruprecht had, through Reichenbach, a specimen from Willdenow's Berlin plant of 1808.

Ruprecht's description of the leaves agrees with that of Willdenow (he did not use the same words); the leaves were small, distichously arranged, and pale glaucous on the under surface. The species can be recognized by these characters, and evidence that the name was well established for it in European gardens in the early years of the 19th century (when very few bamboos were in cultivation) is provided also by two specimens from the herbarium of J. Gay, now at Kew. These

specimens were received in 1868, and were identified as *Bambusa nana* by Munro after the publication of his monograph.

The earlier of these two specimens has on its original label : " *Ludolfia glaucescens* Willd. Enum. p. 1035. *Panicum arborescens* Lam. Illustr., non Linn. *Arundinaria* Beauv. Essai p. 144. Serres de Mr Noisette, 11 Juin 1816 ". This specimen is rather lax, with leaves about 6.5 by 1.3 cm. The other specimen is labelled : " Jardin des Plantes de Perpignan, le 22 Sept. 1823. En Pleine terre. Il n'y fleurit pas ". This second specimen has much smaller and closer leaves than the other ; at Perpignan, in the extreme south of France, it was probably at about the limit of its climatic toleration when planted in the open. It closely resembles dwarfed potted plants of *Bambusa nana* which I have seen in Singapore.

Another example of cultivation in the open in southern Europe, interesting on account of its peculiar flowers, was also reported by Munro (1876). This plant was grown in Florence, and was also in a much dwarfed condition. Munro said of the flowers that they were " in exactly the same monstrous state as in some specimens of the same plant sent to me in 1866 by Mr. Thwaites from Ceylon ".

The name *Bambusa glauca* has also been used for this species. It was used by the nursery firm of Loddiges, and mentioned by Lindley in 1835 without a description. The first published reference I can find is by J. A. & J. H. Schultes (1830, p. 1355) who reported that Blume had sent a specimen named *B. glauca* from Java which they could not distinguish from *Arundinaria glaucescens*, a species they had long known in gardens but had not seen flowering.

Thus we have from many sources evidence of a species of bamboo, with small distichous pale glaucous leaves, introduced to cultivation in Europe before 1800, and widely known after 1808 by the name *glaucescens*, which flowered rarely, its flowers almost always abnormal. I think there can be no doubt that its correct name is *Bambusa glaucescens* (Willd.) Sieb. ex Munro (1868, p. 89). Munro quotes " Sieb. Cat. et Hort. ", referring apparently to MS lists, not to published works. As Willdenow's original specimen has been lost, a neo-type should be selected, preferably from one of the other early flowering specimens.

Many varieties of *B. glaucescens* are in cultivation. Those known in North America have been described by Young (1946) under the name *B. multiplex*. There are doubtless other varieties in China and Japan ; I have made no search of the literature. I have only seen one variety in Malaya, but more may exist. I once thought I had a dwarf variety as a potted plant in Singapore, but when put out into the open ground this plant produced successively taller shoots which were finally indistinguishable from those of the normal hedge bamboo.

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NOTES ON ASIATIC GRASSES : XXV.

A Himalayan *Trisetum*

N. L. BOR

While working on the Indian species of *Trisetum* Pers. a curious problem presented itself in regard to the two species *T. flavescens* and *T. sikkimense*, and it is the purpose of this short paper to clear it up. J. D. Hooker has both these species from Sikkim in the Flora of British India under the names *Avena flavescens* and *A. sikkimensis*. In the folder marked *Avena sikkimensis* by Hooker, he had two sheets, both collected by himself, and these are the sheets to which he refers under the description of *Avena sikkimensis* as follows, "Sikkim Himalaya : Lachen and Lachoong Valleys, alt. 10-11,000 ft.". One half of the problem is evident when an examination of the two sheets shows them to be true *Trisetum flavescens*.

The other half of the problem concerns certain other sheets which bear the name *T. flavescens* in Hooker's handwriting and which differ markedly from true *Trisetum flavescens*.

The problem can now be stated in its entirety. J. D. Hooker had two species of *Trisetum* from Sikkim before him : one was true *T. flavescens* Pers. and the other a new species. He called the new species *T. flavescens*, and to the true *T. flavescens* he gave the name *T. sikkimense* (*Avena sikkimensis*).

The question arises—did Hooker make a slip and transpose the two names, or did he deliberately name the specimens as stated ?

The question is of importance because if he indeed made a slip, the matter can easily be put right by again transposing the names. If on the other hand he described his *Avena flavescens* from a specimen of the new species, then a new name must be given to the latter, and *Avena flavescens* Hook. f. non Linn. enters into its synonymy.

A careful scrutiny of the descriptions of both species in the Flora of British India allows of no other conclusion but that Hooker deliberately called true *Avena flavescens*, *A. sikkimensis*, and gave the name *A. flavescens* to the undescribed species. Perhaps the most striking of the descriptive sentences is that in which, under *Avena flavescens*, he says, "rhachilla nodose below the flowering glumes, penicillate with long hairs". On the sheet collected by A. H. Cummins, which contains a specimen named *T. flavescens* by Hooker, himself, there is a sketch also by Hooker which shows this very feature. The name *Avena sikkimensis* therefore enters into the synonymy of *Trisetum flavescens* and a new name must be found for *Avena flavescens* Hook. f. non Linn.

I propose to name this species as follows :—

***Trisetum scitulum* Bor, nom. nov.**

Avena flavescens Hook. f., Flor. Brit. Ind. 7, 279 (1896) non Linn. (1753).

Distribution : Sikkim, Lachen and Lachoong Valleys.

Exsicc.—Hook. f. s.n., Sikkim (Type, K) ; H. A. Cummins s.n., Northeast Sikkim ; G. A. Gammie 960, Yeumtang, Lachung Valley ; Younghusband 187, Lonak Valley.

Trisetum scitulum differs from *T. flavescens* (Linn.) P. Beauv. by its larger dark-brown spikelets, and longer lemmas and awns.

TYPHULA TRAILLII BERK. & COOKE.

G. W. MARTIN

The original description of this species (Jour. Linn. Soc. Bot. **15** : 391. 1877) reads : "Translucens, firma, stipite elongato ; capitulo oblongo the colour of the dried specimens is yellow ; but the original colour was probably white." The specimen was collected on a dead palm by J. W. H. Traill, along the Rio Madeira, Brazil. Aside from its compilation in Saccardo (Syll. Fung. **6** : 751. 1888), the only reference I have found to the species is that of Corner (Mon. Clav. 736. 1950), who states that it belongs in the Tremellales.

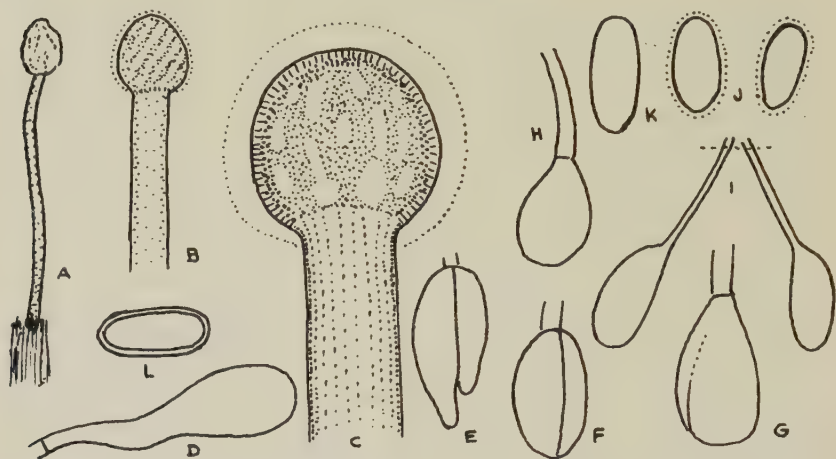
The type is preserved in the herbarium of the Royal Botanic Gardens, Kew, and was borrowed for examination through the courtesy of the Director, with permission to section one of the basidiocarps.

As received, there were seven stalked and capitate fruiting bodies, each about 3 mm. in total height and with ovate-conical heads 0.3–0.4 mm. in diameter (Fig. A). They were horny and reddish brown, the pileus only slightly paler than the stalk. One, which had broken off, was soaked, as a result of which the stalk increased from 0.15 to 0.4 mm. in diameter and the pileus to 0.75 mm. in width and height (Fig. B). A thin surface section was cut off for direct examination and the rest of the pileus was embedded in paraffin, through a butyl alcohol series.

The original mount, in KOH-Phloxine, showed basidia, spores, and sterile hymenial elements. Figs. D, F, G, I, J, K were drawn from this mount. The portion embedded in paraffin proved to be extraordinarily refractive, remaining horny and brittle, the sections shattering and, refusing to flatten on the slide. Nevertheless, enough partial sections were secured to permit some idea of the structure. Small fragments of the paraffin sections, run through xylol, alcohol and water into lactic acid and Acid Fuchsin, when crushed, gave some details (Figs. E, H), and small fragments of the hymenial surface in such mounts gave a fair idea of the hymenium.

The stalk is delimited from the head by a shallow, dome-like region scarcely to be called a columella. The interior of the pileus is characterized by elongate cavities (Fig. C) and the hymenial region covers the entire surface. The head is surrounded by a hyaline, structureless, gelatinous envelope. The hymenium is composed of numerous cylindrical and highly gelatinized dicaryophyses and a few capitate sterile elements (Fig. H), with the basidia occupying a fairly deep zone, as is often characteristic of tremellaceous hymenia. The mature probasidia are oval, $11-13 \times 6-7\mu$. The primary longitudinal septum was distinctly seen (Figs. E, F, G.) and there was some suggestion of the two secondary septa, but these were not entirely clear. Two attached spores on stilt-like sterigmata were seen protruding from a fragment of hymenium in a crushed mount (Fig. I) and numerous spores were observed free in the mounts. Some, surrounded by what appeared to be a gelatinous sheath (Fig. J), were probably immature. Around others, presumably more mature, such a sheath was not discernable (Fig. K), while the majority (Fig. L) had a thick wall. Elongated masses of crystalline material, originating in the subhymenium and penetrating

the hymenium, suggest gloecystidia, although no evidence of surrounding walls was seen. I have attempted a reconstruction of a median section through the pileus and the upper part of the stalk (Fig. C), based on the partial sections and other mounts, but cannot claim for it more than approximate accuracy.



Hyaloria traillii. A. Habit, dry, $\times 12$. B. Pileus and part of stalk, soaked, $\times 12$. C. Diagrammatic reconstruction of longitudinal section of pileus and upper part of stalk, $\times 30$. D. Clavate body in hymenium. E-H. Basidia. I. Two immature spores attached to sterigmata. J-L. Basidio-spores. J. Two detached immature spores, wall gelatinous. K. Spore which has attained full size, but wall not thickened. L. Mature spore with thickened wall. D-L drawn with aid of camera lucida and reproduced at a magnification of $\times 1500$.

The only genus which seems able to accommodate a species with these characteristics is *Hyaloria* Möller (Protobasid. 137. 1885). The original species, *H. pilacre* Möll., was described from southeastern Brazil. Later, I found it in Colombia and reported on it (Mycologia 29 : 620. 1937). Like the *Typhula*, both of these collections were on decayed palm stems. *Hyaloria* is often referred to as angiocarpous, but this is not justified either by Möller's description nor by the fungus itself. It is true that the head in *H. pilacre* is surrounded by a dense gelatinous sheath in which the discharged spores are retained and that the spores themselves, borne on highly modified sterigmata and developing a thick wall after detachment, suggest those of certain gasteromycetes. *T. traillii* has a similar, but apparently less copious, gelatinous envelope and the spores are similar and borne in much the same way. It differs in its small size and slender habit and, much more significantly, in the different morphology of the pileus. By transferring *T. traillii* to *Hyaloria*, it is being put in a genus with which it seems to have close affinity. I am adding a somewhat more complete description, but only additional collections can serve as the basis for an adequate account.

***Hyaloria traillii* (Berk. & Cooke) Martin comb. nov.**

Stalked and pileate, total height 2.5–3 mm., translucent, firm ; when dry, horny ; stipe reddish brown, darker at base, $\frac{3}{4}$ to $\frac{4}{5}$ the total height ; pileus irregularly globose, 0.3–0.4 mm. in diameter and about the same

or slightly more in height ; when soaked, becoming paler, the stipe increasing 2 to $2\frac{1}{2}$ times in diameter and the pileus the same (not including the gelatinous envelope), with little or no increase in length ; interior of pileus elongate lacunose, with long-fusiform, brown, crystalline aggregates radiating from center and penetrating base of hymenial region ; hymenial layer occupying entire surface, composed of cylindrical dicaryophyses and deeply immersed basidia, with a small number of capitate elements ; probasidia oval, $11-13 \times 6-7\mu$, becoming longitudinally septate into 2, 3 or 4 (?) segments, each segment producing a basidiospore on a stilt-like sterigma ; basidiospores ovate-cylindrical, $8-9.5 \times 4\mu$, remaining immersed in gelatinous envelope and developing a thick wall.

It is quite possible that when freshly collected the color was white or nearly so, as suggested by Berkeley, and it is also possible that collections on a more favorable substratum might be larger. Only additional collections can determine these points.

Snowdrops and Snowflakes.*—The two genera of *Galanthus* and *Leucojum*, of the family *Amaryllidaceae*, have long been known as delightful hardy garden plants, appreciated both for their intrinsic beauty and for the fact that many of the species flower when the rest of the living garden is still dormant. Sir Frederick Stern has produced an up-to date and full account of the fifteen species of *Galanthus* and nine species of *Leucojum* which he accepts. This will be of very great value both to botanists and to horticulturists and the Royal Horticultural Society is to be congratulated on the excellence of the fount and format.

The botanical history and early literature of the two genera, which were for a long time united but were separated by Linnaeus, are adequately outlined. As now understood the genera are separated by perianth characters : in *Leucojum* the six tepals are of equal length while in *Galanthus* the three inner are shorter than and of different shape from those of the outer whorl. Our author divides *Galanthus* into three series on the veneration of the leaves : *Nivales*, with the leaves applanate or flat against each other ; *Plicati*, with the leaves with the margins folded back ; and *Litifolii*, with the leaves convolute the outer rolled round the inner. The morphology, geographical ranges, and cytology of *Galanthus* are considered and a key is provided to the species, subspecies, and some of the varieties, and this is followed by an enumeration of the species. In this last, synonyms, descriptions, quotation of specimens (mainly from the herbaria at Kew and the British Museum), and discussions are given. An account of garden varieties of *Galanthus* is from the pen of the late Mr. E. A. Bowles and is followed by an alphabetical list with bibliographical references and a short chapter on cultivation.

* F. C. Stern : *Snowdrops and Snowflakes*, a study of the genera *Galanthus* and *Leucojum*, The Royal Horticultural Society, London, 1956. pp. 128, with coloured and uncoloured illustrations and a map, 25/-.

The account of *Leucojum* follows a similar arrangement with chapters on the classification, morphology, geographical range, cytology, keys and enumeration of species and varieties.

The cytology of the two genera has some features of interest. All the species of *Galanthus* examined are diploids ($2n = 24$) except one "form" of *G. rizehensis* with 36 chromosomes, "forms" of *G. elwesii* with 48, and some garden variants. In *Leucojum*, somatic numbers recorded are 14, 16, 18, 21, and 22. It is suggested that, taking the gross morphology, cytology, and phytogeography into account, a common ancestral group gave rise to *Leucojum* and to *Galanthus* and that *L. autumnale* ($x = 7$) is the most primitive existing species of the former genus. The ancestral group may have been driven south from central Europe with the on-coming of the Glacial Period and it is probable that *Leucojum* evolved in the west of the Iberian Peninsula and North Africa and *Galanthus* in the east, especially in the Caucasus and Asia Minor.

A word of praise must be given to the excellent and apposite illustrations, mostly by Miss E. M. Stones and the late Mr. E. A. Bowles.

W. B. TURRILL.

Botanical Textbook.*—Although the author states that this book has been written for 1st and 2nd year students in American colleges, it would seem more appropriate for British fifth and sixth formers. Perhaps the title of "Elementary Botany" would be rather more in keeping with the contents than its present all-embracing one. For instance, the section on photosynthesis, whilst being lucidly written, is in very general terms under headings such as "*Photosynthesis like a factory process*" (p. 35). The work covers a tremendous field, for it includes morphology, anatomy and physiology in the broadest sense, as well as "Heredity", "Ecological Relations" and "Evolution" in the first part of *General Principles*. In part 2, *The Plant Kingdom*, selected types are described from each class of plants, concluding with pollination in the Angiosperms and a further chapter on evolution in plants. Surely the questions at the end of each chapter are rather superfluous in a book of this kind?

The line drawings are clear and the photographs are interesting and often unconventional for a textbook, but for one who is unfamiliar with N. American vernacular names many of them are baffling and the inclusion of the scientific names in parenthesis would be a great help. From the taxonomic point of view the definition of a species is beautifully hedged (p. 304) and it seems from the next page that varieties occur in cultivation alone. The format is attractively contemporary and the paper throughout is of the good-quality glossy type so favoured by American publishers. The fact that this is the 3rd edition since 1942 is some indication of its value.

F. N. HEPPER.

* Botany. By Paul Weatherwax. Philadelphia: W. B. Saunders Co. 3rd edition, 1955, pp. 509, illustrated. Price in Britain 40/-.

AFRICAN ORCHIDS : XXIII.*

V. S. SUMMERHAYES

Descriptions of eleven new species are included in this contribution as well as miscellaneous taxonomic and nomenclatural notes. The type specimens of the new species are in the Kew Herbarium unless stated otherwise.

Neobolusia ciliata *Summerhayes*, sp. nov. ; a *N. tysoni* (Bolus) Schltr. floribus paulo majoribus, labello late hastato marginibus dense ciliatis facile distinguenda.

Herba terrestris, gracilis, 20–30 cm. alta, labello excepto glabra. *Caulis* saepius leviter flexuosus, teres vel propter folios longe decurrentes leviter angulatus, basi 1–1.5 mm. diametro. *Folia* 3–4, distantia, infimum vaginiforme acutum, superiora lanceolata vel late lanceolata, acuta vel acuminata, sursum decrescentia, supremum bracteis simile, usque ad 5.5 cm. longa et 1.5 cm. lata. *Inflorescentia* terminalis, racemosa, 7–10 cm. longa, laxe 4–7-flora ; bractee lanceolatae, acuminatae, basi vaginiformes, inferiores usque ad 1.6 cm. longae, ovarium pedicellatum aequantes vel superantes. *Flores* suberecti, virides, labello purpureo vel brunneo ; pedicellus cum ovario circiter 1 cm. longus. *Sepalum intermedium* erectum, lanceolatum, breviter acuminatum, concavum, 9–9.5 mm. longum, 3–4 mm. latum ; sepala lateralia patentia, oblique anguste lanceolata, acuta vel breviter acuminata, 9.5–10.5 mm. longa, 3–3.7 mm. lata ; omnia sepala subquiquenervia, nervis exterioribus \pm ramosis. *Petala* erecta, basi margine postico cum columna adnata, oblique ovata vel oblique lanceolata, apice apiculato-acuminata, basi margine antico rotundato-dilatata, 6–8 mm. longa, 2.7–3.7 mm. lata, trinervia, nervo antico ramoso, saccis pellucidis crystalliferis numerosis instructa, apice interdum breviter ciliolata. *Labellum* porrectum, late rhomboideo-hastatum, in toto 11–13.5 mm. longum, 9–10.5 mm. latum, lobo intermedio ovato apiculato 6–7.5 mm. longo 5.5–7 mm. lato, lobis laterilibus \pm incurvatis triangularibus acutis vel truncatis bilobulatis 1–2.5 mm. longis, basi callis duobus oblongis parallelis instructum, marginibus totis dense ciliatis, plurinervium, nervis \pm radiatis. *Columna* leviter decurvata, apice rotundata, 4–5 mm. alta ; antherae loculis parallelis, pollinii viscidii ellipticis nudis ; rostellum plicatum paulo cucullatum, stigmatibus pulvinaribus superne divergentibus.

SOUTHERN RHODESIA. Makoni District, Rusapi, in shelter of boulders, Jan. 1935, *Eyles* 8358 (type) ; Melsetter Distr., Chimanimani, 1950 m. alt., Jan. 1954, *Ball* 200 (S.R. Gov. Herb. 46245) ; Mutsarara, 1800 m. alt., on grassy summit plateau, Jan. 1955, *Ball* 469 (S.R. Gov. Herb. 50238). "Sepals greenish to straw-coloured, purple veined ; petals pale green rimmed with pale purple, pellucid-punctate ; labellum deep glossy purple or satiny brown, pale or greenish at apex and green along middle below."

This delightful little species is easily recognised from the other species of the genus on account of the lobed hastate labellum which is densely ciliate all round the margin. As regards the general floral structure it is a typical member of the genus and in habit closely resembles both *N. tysoni* (Bolus) Schltr. and *N. stolzii* Schltr.

* Continued from K.B. 1953, 591.

Cynorchis kassneriana Kraenzl. in Engl. Bot. Jahrb. **51**, 377 (1914).

C. rupicola Schltr. in Engl. Bot. Jahrb. **53**, 490 (1915) ; Mansf. in Fedde, Rept. Spec. Nov. Beih. **68**, t. 21, No. 81 (1932).

Examination of Iso-type material of both of the above species, together with many other gatherings including material in liquid preservative, shows that they are conspecific. Schlechter makes no reference to *C. kassneriana* when describing his species and he evidently overlooked it. *C. rupicola* is referable to the typical sub-species *kassneriana*.

I have now seen material of this species from Uganda and Kenya Colony in the north southwards to Southern Rhodesia. There is considerable variation in the shape and size of the single basal leaf but the flowers are remarkably constant in structure in the typical subspecies of *C. kassneriana* though they differ somewhat in sub-species *tenuior* (see Kew Bull. **1953**, 129).

Habenaria (sect. **Pentaceras**) **amoena** Summerhayes, sp. nov. ; a *H. supplicanti* Summerh. foliis multo majoribus, floribus paulo majoribus, calcaris satis longiore versus apicem minus inflato facile distinguitur.

Herba terrestris, 25–65 cm. alta, radicibus exceptis glaberrima. *Tubera* ellipsoidea vel globosa, 15–17 mm. longa, 10–17 mm. diametro, dense breviter lanuginosa. *Caulis* erectus, per totam longitudinem foliatus, teres, 12–37 cm. longus, basi usque ad 4 mm. diametro. *Folia* 5–12, suberecta vel erecto-patentia, infima 1–2 ad vaginas \pm redacta, intermedia lanceolata vel oblanceolata, acute vel breviter acuminata, inferne \pm cuneatim angustata, usque ad 7–13 cm. longa et 2–4 cm. lata, superiora decrescentia in bracteis abeuntia, textura chartacea, pallide viridia. *Inflorescentia* racemosa, multiflora, 10–30 cm. longa, 2.5–4 cm. diametro ; rhachis obtuse pluriangulata, recta vel prope apicem leviter fractiflexa ; bracteae lanceolatae, acuminatae, ovario pedicellato breviores vel interdum id fere aequantes. *Flores* arcuatim patentes, virides vel albido-virides, \pm fragrantis ; pedicellus cum ovario arcuatus, 1–2 cm. longus. *Sepalum* intermedium erectum, convexum, ovatum vel late ellipticum, apice rotundatum vel obtuse apiculatum, 4.5–6 mm. longum, 3.3–3.7 mm. latum, tri- vel subquinquenervium, nervis extra humiliter carinatis ; sepala lateralia deflexa, oblique vel leviter curvatim semi-ovata, apice obtusa vel acuta, 5.8–7.7 mm. longa, 2.75–3.5 mm. lata, tri- vel subquinquenervia. *Petala* fere ad basin bipartita ; partitio postica (superior) curvatim ligulata, apice acuta, cum sepalo intermedio leviter agglutinata, 4.5–5.5 mm. longa, 0.7–1.3 mm. lata, 1–3-nervis ; partitio antica (inferior) \pm incurvata vel falcata, linearis, apicem versus sensim angustata, 7.5–9.5 mm. longa, 0.3–0.5 mm. lata, uninervis. *Labellum* ex ungue brevi tripartitum ; partitio intermedia deflexa, ligulata, apice acuta vel obtusa, lateribus reflexis ita ut videtur longitudinaliter convexa, apice interdum breviter incurvata, 5.5–8.5 mm. longa, 0.8–1.3 mm. lata ; partitiones laterales patentim deflexae vel reflexae, ex intermedia angulo acuto divergentes, lineares, dimidio apicali sensim angustatae, interdum \pm flexuosae, 8–10 mm. longae, inferne 0.3–0.6 mm. latae, uninerviae ; calcar dependens, anguste cylindricum, dimidio apicali leviter inflatum tantum, 17–22 mm. longum. *Columna* brevis, crassa ; anthera mutica, 1.75–2 mm. alta, canalibus 0.3–0.6 mm. longis,

auriculis ellipticis rugulosis ; stigmata deflexim porrecta, parallela, ad unguem labelli adpressa, digitiformia vel cylindrica, apicem versus aut angustata aut leviter clavata, 1.7–3 mm. longa ; rostellum lobus intermedius late triangularis, acutus vel obtusus, 0.5–0.75 mm. altus.

BELGIAN CONGO. Bas Congo, 15 km. N. of Kisantu, on marshy banks of R. Ngufu, 580 m. alt., in swampy herb savanna on white sand, April 1944, *Germain* 2050 ; Katanga, Etoile Arboretum, 5 km. N.E. of Elisabethville, on open slope, April 1950 *Schmitz* 2774.

TANGANYIKA TERRITORY. Rungwe Distr., Mbosi Mkama, 1800 m. alt., fairly common, April 1932, *Davies* 559.

NORTHERN RHODESIA. Abercorn Dist., Chilongowelo, 1440 m. alt., in thick bush among grass, March 1952, *Richards* 1000 (type) ; Kalambo Falls, in bush near path at top, March 1952, *Richards* 1260 ; Lunzua Forest above Kafakula, 960 m. alt., in shady woodland on deep damp loam soil, March 1955, *Richards* 4788.

SOUTHERN RHODESIA. Salisbury Distr., in woodland, Feb., *Greatrex* 43 ; same area, in savanna, 1440 m. alt., March 1944, *Greatrex* S.R. Gov. Herb. 11876.

This species clearly has a wide distribution, occurring in open woodland or woodland patches in savanna regions. It is allied to a number of other rather similar species and is probably closest to *H. supplicans* Summerh. from which it differs by the characters given in the diagnosis. *H. malacophylla* Rchb. f., which is also a near ally, is a taller plant with larger more obviously oblanceolate leaves which turn much blacker on drying ; it also has larger flowers but the spur is much shorter and much more thickened in the distal part.

Platycoryne kitondo (*De Wildem.*) *Summerh.*, comb. nov.

Habenaria kitondo De Wildem. in Ann. Mus. Congo, **4**, 23 (1902).

Centrostigma occultans (*Welw. ex Rchb. f.*) *Schltr.* in Engl. Bot. Jahrb. **53**, (1915), in obs.

Habenaria occultans Welw. ex Rchb. f. in Flora, **48**, 178 (1865).

H. schlechteri Kraenzl. in Rchb. f. Xen. Orch. **3**, 148, t. 286, fig. 5–9 (1896).

Centrostigma schlechteri (Kraenzl.) *Schltr.* in Engl. Bot. Jahrb. **53**, 523 (1915), in obs.

C. nyassanum *Schltr.* l.c. 523.

On further investigation and the availability of more material, from Northern Rhodesia and central Tanganyika especially, I am convinced that only one species is represented by the above names. The presence of an additional outgrowth on each stigmatic arm, as mentioned in my previous discussion of the group (*Kew Bull.* **1934**, 206), is by no means a constant feature. In one flower from Northern Rhodesia (*Milne-Redhead* 3534) which I examined, one stigmatic arm had the additional outgrowth, whereas this structure was entirely lacking on the other stigmatic arm. In other gatherings (e.g. *Stolz* 2352) the length of the outgrowth may vary from 0.8–4.5 mm. in different plants, as I have previously mentioned. In other respects plants from Angola are similar to those from a wide area in eastern Africa, from Tanganyika southwards to the Transvaal.

Centrostigma papillosum *Summerhayes*, sp. nov. : a *C. occultans* (*Welw. ex Rchb. f.*) *Schltr.* petalis basi breviter bilobatis, labelli lobis lateralibus fere integris erectis, calcaribus multo brevioribus, anthera dimidio

breviore, stigmatum brachiis superioribus subspathulato-ligulatis obtusis papillois facile distinguendum.

Herba terrestris, fere glabra, usque ad 60 cm. alta, siccitate nigrescens; tuber ovoideum, 1.5 cm. longum, glabrum. *Caulis* erectus vel adscendens, foliosus, leviter angulatus, basi usque ad 6 mm. diametro, apice 6–12-florus. *Folia* 5–8, erecta, caulis amplexantia, imbricata, lanceolata vel lineari-lanceolata, \pm acuminata, basi vaginantia, inferiora usque ad 12 cm. longa et 1.5 cm. lata, sursum decrescentia in bracteas abeuntia. *Racemus* 7–15 cm. longus, subdensiflorus; bracteae foliaceae, lanceolatae, acuminatae, usque ad 3.5 cm. longae, ovarium pedicellatum saepius superantes. *Flores* arcuatim suberecti, virides; pedicellus cum ovario 2–3 cm. longus. *Sepalum* intermedium erectum, valde concavum, cum petalis galeam formans, late ovatum, acutum vel leviter acuminatum, 10–12 mm. longum, explanatum circiter 8 mm. latum, subquinque-nervium; sepala lateralia patentia vel reflexa, oblique lanceolata, apice subacuta dorso acumine subulato instructa, 10–12 mm. longa, 3.5–4 mm. lata, trinervia. *Petala* erecta, \pm parallela, ligulato-lanceolata, basi margine antico breviter lobulata, lobulo circiter 1 mm. longo, apice acuta, 9–9.5 mm. longa, circiter 2.5 mm. lata. *Labellum* ex ungue 2 mm. longo cum columna adnato tripartitum; partitio intermedia deflexa, ligulata, obtusa, apicem versus sensim angustata, marginibus leviter recurvatis, 11–12 mm. longa, basi 2–2.5 mm. lata, trinervia; partitiones laterales erectae, parallelae, cuneato-oblancoolatae vel cuneato-oblongae, apice oblique truncatae marginibus posticis crenulatis vel sinuato-dentatis, 10–12 mm. longae, 2.5–3 mm. latae, subcarnosae; calcar dependens, cylindricum, dimidio apicali leviter inflatum tantum, apice obtusum, 2–2.5 cm. longum. *Anthera* reclinata, circiter 3 mm. alta, loculis parallelis 3.5–4 mm. longis, canalibus leviter incurvatis circiter 3 mm. longis apice truncatis. *Processus* stigmatiferi bibrachiati; brachia inferiora truncato-clavata, incurvatim deflexa, 3 mm. longa; brachia superiora porrecta, parallela, subspathulato-ligulata, apice obtusa, dense papillosa, circiter 5 mm. longa; rostellum lobus intermedius inter antherarum loculos situs, triangularis, obtusus vel subacutus, lobi laterales incurvati, apice truncati, stigmatibus brachiis inferioribus breviores.

SOUTHERN RHODESIA. Marandellas Distr., Digglefold, 1500 m. alt., in permanent swamp, Jan. 1949, Corby S.R. Gov. Herb. 22647; same locality, Dec. 1949, Greatrex S.R. Gov. Herb. 26451 (type).

This species, though it resembles the previously described member of the genus, *C. occultans* (Welw. ex Rchb. f.) Schltr., in general habit and the marked blackening on drying, differs from that species in a number of important points. In the first place the anther, instead of being erect on the front of a relatively tall column, is more or less reclinate, and the canals (together with the side lobes of the rostellum) are comparatively short and stout. The upper branch of each stigma arises at about the same point as in *C. occultans* but is shorter and more or less straight with a slightly broadened rounded apex instead of horn-like and incurved as in the other species. These outgrowths are densely papillose all over, from which feature the specific epithet is derived. In this respect they resemble the upper stigmatic outgrowths found in the genus *Roeperocharis*, but in all other features the two genera are very unlike. The side-lobes of the labellum in *C. papillosum* are erect in position and parallel to one another;

they are almost entire with only a slightly crenulate or sinuate margin in the upper part, in comparison with the fimbriate margins in *C. occultans*. Finally, *C. papillosum* has quite a short spur to the labellum, only just exceeding 2 cm. in length, which is in marked contrast to the over 10 cm. long slender spur of its ally.

Centrostigma clavatum *Summerhayes*, sp. nov. ; affine *C. occultanti* (Welw. ex Rchb. f.) Summerh. a quo labelli lobis longioribus, lateralibus quam intermedio satis longioribus, calcarii dimidio brevioris parte apicali clavato-inflato, stigmatum brachii superioribus (vel appendicibus) columnam superantibus facile distinguitur.

Herba terrestris, erecta, 40–80 cm. alta, fere omnino glabra, siccitate fere nigrescens ; tubera non visa ; caulis simplex, per totam longitudinem foliatus, fere teres, basi usque ad 6 mm. diametro. *Folia* e basi longe vaginante fere erecta, e cauli paulo divergentia tantum, 8–10, 1 vel 2 inferiora ad vaginas redacta, intermedia anguste lanceolata, acuta vel acuminata, usque ad 18 cm. longa et 2·3 cm. lata, nervis 3–5 subtus prominentibus, superiora breviora, lanceolata, in bracteas abeuntia. *Inflorescentia* terminalis, 5–20 cm. longa, 6–7 cm. diametro, subdense 3–15-flora ; bracteae foliaceae, imbricatae, lanceolatae, acuminatae, usque ad 8 cm. longae et 1·8 cm. latae, ovarium pedicellatum superantes. *Flores* arcuatim patentes, pallide virides vel albi ; pedicellus cum ovario valde arcuatus, circiter 4 cm. longus. *Sepalum* intermedium erectum, apice recurvatum, oblongo-ovatum, acuminatum, valde convexum, columnam amplectens, 16–20 mm. longum, explanatum 12–13 mm. latum, quinquenervium ; sepala lateralalia reflexa, valde curvatim lanceolata, acuminata, 21–23 mm. longa, 5–6·5 mm. lata, tri- vel subquadri-nervia ; omnia sepala acumine breviter pubescente. *Petala* erecta, subfalcitum vel curvatim ligulato-lanceolata, acuta, 17–23 mm. longa, circiter 6 mm. lata, dimidio superiore marginibus ciliolatis, binervia. *Labellum* ex ungue cum columna adnato 4–5 mm. longo profunde tripartitum, glabrum ; partitio intermedia deflexa, lanceolato-ligulata, subacuta, 23–27 mm. longa, paulo supra basin 1·8–3·2 mm. lata, apicem versus sensim angustata ; partitiones laterales patentes, lineari-ligulatae, dimidio vel triente apicali utrinque breviter pectinato-fimbriatae, fimbriis usque ad 5–11 mm. longis, 29–36 mm. longae, 2·5–4 mm. latae ; calcar leviter incurvatum, dimidio basali anguste cylindricum, dimidio apicali clavato-inflatum, apice ipso rotundato, 5·8–7 cm. longum, 3–4 mm. diametro, in bractea absconditum. *Columna* erecta, 10–11 mm. alta, apice rotundata ; anthera stipitata, loculis parallelis, canalibus falcitum incurvatis 18 mm. longis parte libera erecta circiter 6 mm. longa, auriculis oblongis vix 2 mm. longis ; brachia stigmatifera porrecta vel leviter deflexa, apice leviter clavata valde oblique truncata, 7–9 mm. longa, appendicibus (vel brachiis superioribus) incurvatim erectis linearibus vel lineari-subulatis 12–14 mm. longis antheram superantibus ; rostellum lobus intermedius erectus, inter loculos antherarum interpositus, anguste lanceolato-triangularis, acutus, 5–6 mm. longus, lobi laterales cum antherae canalibus adnati et eis aequilongi.

NORTHERN RHODESIA. Abercorn Distr., between Abercorn and Kambole, near Lunzua River, in swampy grassland, Dec. 1949, *Bullock* 2160 (type) ; Ndundu, 1500 m. alt., in small dambo, among long grass in wet marsh, Feb. 1952, *Richards* 885 ; same locality, in peaty marsh among grass, Feb. 1955, *Richards* 4477.

This species is much closer to *C. occultans* (Welw. ex Rchb. f.) Schltr. in floral structure than is *C. papillosum* Summerh. It may be distinguished easily, however, by the much shorter strongly clavate spur and the long lobes of the labellum, the lateral lobes of which are even longer than the middle one. The horn-like upper branches of the stigmatic arms are also taller than in *C. occultans*. In general floral structure and appearance the new species closely resembles its older congener. So far *C. clavatum* has been found only along the Lunzua River near Abercorn but the three gatherings cited above show good agreement in all points, particularly those distinguishing the species from *C. occultans*.

Disperis nitida Summerhayes, sp. nov. ; affinis *D. thomensis* Summerh., a qua sepalorum lateralium calcaribus multo brevioribus, petalis latoribus basi et apice magis dilatatis, labelli ungue brevioris quam appendicibus paulo longiore vel brevioris, rostellii brachiis dimidio brevioribus satis distinguitur.

Herba terrestris vel epiphytica, 15–30 cm. alta, fere omnino glabra ; caulis erectus, teres, basi leviter incrassatus cataphylla acuta vel acuminata vaginante vestitus radices flexuosas laxae tomentosae emittens, medio vel supra medium foliis duobus oppositis instructus, apice 1–4-florus, inferne 1–3 mm. diametro. *Folia* ovata, basi \pm cordata vel rotundata, apice acuminata, 1.5–7 cm. longa, 1.2–6 cm. lata, textura \pm translucida, supra nitida. *Inflorescentia* pauciflora, usque ad 12 mm. longa ; bractae foliaceae, late vel anguste lanceolatae, acuminatae, usque ad 1.5 cm. longae. *Flores* erecti vel suberecti, albi, pedicellus cum ovario circiter 1 cm. longus. *Sepalum* intermedium valde arcuatum vel incurvatum, anguste lanceolatum, valde convexum, in toto circiter 1 cm. longum, cum petalis connatum, galeam anguste rotundatam circiter 5 mm. longam formans ; sepala lateralia horizontalia, oblique semi-obovata, apice apiculata incurvata, medio prope marginem anticam calcaris brevi obtuso instructa, fere 1 cm. longa, 3.7–4.5 mm. lata, quadrinervia. *Petala* secus marginem posticam cum sepalo intermedio connata, \pm C-formia, apice cuneatim dilatata \pm bilobata, lobulo postice subacuta, medio margine postica lobulo brevi instructa, basi margine antica in lobum ovatum vel oblongum dilatata, in toto 6.5–7.5 mm. longa, prope basin circiter 3 mm. lata, trinervia. *Labellum* basi cum columnae adnatum, superne liberum, ungue lineari incurvato 2.5–3.5 mm. longo, infra apicem appendicibus duabus parallelis cuneatis superne bifidis marginibus \pm papillosis vel ciliatis circiter 2.5 mm. longis instructum, apice ipso decurvatum faciei superiore dense hirsutum. *Rostellum* scutelliforme, antice bilobatum, brachiis porrectis brevibus 0.5 mm. longis.

BRITISH CAMEROONS. Bamenda, above Lake Oku, 1800–2100 m. alt., in mountain forest, in deep shade, Sept. 4th 1952, *Savory* UCI. 451 (type) ; Bamenda, Bambaleu, 1800–2100 m. alt., in mountain forest, in deep shade, Sept. 3rd 1952, *Savory* UCI. 475.

This is clearly a near ally of *D. thomensis* Summerh., from French Guinea, Sierra Leone, São Tomé and Northern Rhodesia, from which it differs in various features of the floral structure. The most obvious difference is in the spurs on the lateral sepals, which in *D. thomensis* are long and project markedly from the sides of the sepals whereas in *D. nitida* they are very short and only visible on close examination. Correlated with this are the

very short rostellar arms in *D. nitida*, these being more than twice as long in *D. thomensis*. Other differences in the petals and labellum are mentioned in the diagnosis.

Like *D. thomensis*, the present species occurs either on the ground in shade under trees or growing epiphytically on the lower parts of the trees.

Disperis togoensis Schltr. in Engl. Bot. Jahrb. **38**, 2, fig. 1 (1905).

D. cordata Summerh. in Kew Bull. **1933**, 252 ; non Sw.

D. cardiopetala Summerh. in Hook. Ic. Pl. **33**, t. 3270 (1935).

When I first described *D. cordata* (later changed to *D. cardiopetala*) I allied it with *D. togoensis*, giving the supposed differences between them. Since then I have seen a considerable number of further gatherings of this group, including material in spirit from Togo. This material shows that the differences mentioned by me, which were based on Schlechter's description and figure, are either of no significance or do not really exist. I have now seen specimens in which the vegetative features are quite intermediate between those postulated for the above two concepts. There seems little doubt that the apparent right-angled divergence of the appendages of the labellum shown in Schlechter's figure is merely the result of the way in which that organ was spread out. The supposed differences in the lengths of the appendages and in the shape of the labellum lamina, given by me in the Flora of West Tropical Africa (**2**, 417 : 1936) or in the Icones Plantarum, are also evidently the result of insufficient material being available.

Platylepis glandulosa (Lindl.) Rchb. f. in Linnaea, **41**, 62 (1877).

Notiophrys glandulosa Lindl. in Journ. Linn. Soc. Lond. Bot. **6**, 138 (1862).

Diplogastra angolensis Welw. ex Rchb. f. in Flora, **48**, 183 (1865).

Platylepis angolensis (Welw. ex Rchb. f.) Durand & Schinz, Consp. Fl. Afr. **5**, 58 (1895).

P. australis Rolfe in Kew Bull. **1906**, 378.

? *P. nyassana* Schltr. in Engl. Bot. Jahrb. **53**, 557 (1915) ; Mansf. in Fedde, Repert. Spec. Nov. Beih. **68**, t. 51, fig. 201 (1932).

This species, as I now understand it, is distributed from French Guinea in the west to the Anglo-Egyptian Sudan in the east and southwards to Angola, Mozambique and Natal. It is, however, clearly a very local plant and there are large gaps in our present knowledge of its distribution.

Rolfe separated the Natal material, which had been previously recorded as *P. glandulosa*, as a distinct species differing in certain features. Of these the supposedly wider lateral sepals are in fact no wider than in *P. glandulosa*, while the bigibbous base of the labellum is found also in that species. The sharply reflexed lateral sepals is also a doubtful character as examination of Tropical African material suggests that these are more or less reflexed or spreading in many specimens of *P. glandulosa*. Structurally I can see no significant differences between Tropical and South African specimens and I therefore consider them as referable to one species.

P. nyassana Schltr., described from material collected by Stolz in southern Tanganyika Territory, seems likely also to be conspecific with *P. glandulosa*, but the only material now available is in bud while Schlechter's drawings, as published by Mansfeld, differ in certain respects from the other specimens which I have seen.

P. glandulosa appears to differ from *P. occulta* (Thou.) Rchb. f., judging from a number of Mauritian specimens referred to the latter species and also Thouars' plate, in the relative lengths of the anther and rostellum arms. In the mainland species the rostellum arms are as long as, or longer than, the anther and taper gradually from the base without any thickened median line. In *P. occulta* they are much shorter than the anther, suddenly narrowed into a fine point or terminate in a short tooth and have a much thickened median portion. The flowers are also longer than in *P. glandulosa* with a longer slender column.

Corymborchis corymbosa Thou. Orch. Iles Austr. Afr. prem. tabl. synopt., tt. 37, 38 (1822).

C. thouarsii Rchb. f. in Bot. Zeit. **7**, 868 (1849).

C. welwitschii Rchb. f. in Flora, **48**, 183 (1865).

Examination of a large number of specimens of the genus from Tropical Africa and critical assessment of the information provided about the Mascarene species (I have seen no specimens) has convinced me that only one species is known from the Afro-Mascarene region. No satisfactory differences, indeed no differences at all, have ever been put forward for distinguishing the two species recognised hitherto. The only comparative descriptions published are those by Rolfe in the Flora of Tropical Africa (**7**, 180 : 1897) and practically all the differences he mentions are shown to be of no importance on examination of the mainland material available. Blume's plate (Orch. Archip. Ind. et Jap. **1**, t. 44, fig. 1A-C : 1858), made evidently from Mascarene specimens at Paris, shows a plant agreeing in all details with Tropical African material. It is also surely significant that all the other species of *Corymborchis*, although they have been confused with *C. corymbosa* in the past, are quite easily distinguishable on account of their much smaller flowers and shorter persistent column.

Polystachya (sect. ***Caulescentes***) ***fractiflexa*** Summerhayes, sp. nov. ; a *P. caloglossa* Rchb. f. caulibus gracilioribus, foliis anguste oblongo-lanceolatis textura firmioribus nec oblanceolatis, floribus minoribus, labelli lobis lateralibus ovato-triangularibus subacutis nec late rotundatis, a *P. imbricatæ* Rolfe inflorescentiis brevibus rhachide *fractiflexa*, labello pro rata latiore, capsulis 3-3.5 cm. longis satis distinguitur.

Herba epiphytica, fere omnino glabra, usque ad 26 cm. alta ; caules caespitiosi, erecti, graciles, teretes, inferne 2-4 mm. diametro vagina subarcta subacuta instructi, superne sensim angustati foliati, basi radices ramosas flexuosas griseas emittentes. *Folia* 3-5, suberecta, anguste oblongo- vel ligulato-lanceolata, utroque angustata, apice acuta, basi vaginantia, lamina 6-13 cm. longa, 9-20 mm. lata, siccitate firme chartacea atro-brunnea. *Inflorescentia* terminalis, 2-5 cm. longa, saepius paniculata ; rami 1-4 (terminalis inclusus), usque ad 2 cm. longi,

laterales suberecti, rhachide fractiflexa, usque ad 11-flori; bracteae breves, triangulares, acuminatae, 1-2 mm. longae. *Flores* suberecti, de colore nil constat; pedicellus cum ovario circiter 7 mm. longus. *Sepalum* intermedium late oblongo-lanceolatum, breviter acuminatum, convexum, 6 mm. longum, 2 mm. latum; sepala lateralia oblique triangulari-ovata, apice acuminata, margine posteriore (superiore) circiter 7.5 mm. longa, cum columnae pede adnata mentum obtuse conicum 6.5 mm. longum formantia; omnia sepala extra parcellissime puberula, subquiquenervia. *Petala* curvatim ligulato-subspathulata, apice brevissime apiculata, 5 mm. longa, circiter 1.75 mm. lata, sub-binervia. *Labellum* recurvatum, ex ungue angusto circiter 2.5 mm. longo canaliculato late trilobatum, totum 5.4 mm. longum et 7.8 mm. latum; lobus intermedius rotundato-delloideus, obtusissimus, 1.5 mm. longus, basi 2.7 mm. latus; lobi laterales erecto-patentes, ovato-triangulares, apice subacuti vel obtusi, margine antico 2.5 mm. longi; discus callo brevi quadrato instructus. *Columna* brevis, apice truncata. *Capsulae* elongato-ellipsoideae vel cylindricae, leviter 6-costatae, 3-3.5 cm. longae, 7-10 mm. diametro.

BRITISH CAMEROONS. Near Tombel, on Cacao tree, Nov. 1950, in fruit, *Thorold* TN37.

BELGIAN CONGO. Tshuapa, Basankusu, Nov. 1906, *Bruneel* (type in Herb. Brussels).

This species is apparently related to *P. caloglossa* Rchb. f. on the one hand and to *P. imbricata* Rolfe on the other. It possesses the short inflorescence, flexuous rhachis with spreading bracts and large fruits (over 3 cm. long) of *P. caloglossa* but is a more slender plant with a more delicate inflorescence and smaller flowers. It also differs in the structure of the labellum, as indicated in the diagnosis.

The shape of the leaves is very similar to that in *P. imbricata* while the flowers also approach those of some forms of this species, but the flexuous rhachis and large fruits distinguish it; in *P. imbricata* the capsules usually vary from 1.7 to 2.5 cm. in length only rarely approaching 3 cm.

Polystachya (sect. **Caulescentes**) **imbricata** Rolfe in Kew Bull. 1893, 172.

This species, which is clearly closely allied to *P. bennettiana* Rchb. f., has a wide distribution in Tropical Africa and shows a considerable range of variation. *P. bennettiana* differs from *P. imbricata* in the somewhat inflated sheaths on the stems, the fewer leaves (2-4), the pubescent peduncles and flowers, and the even more pronounced trilobed labellum in which the more or less ovate lateral sides are nearly as large, if not always as long, as the middle lobe. It is restricted to Abyssinia, so far as present records go.

As compared with *P. transvaalensis* Schltr., which also has a wide distribution in East Africa, *P. imbricata* is a more slender plant with narrower more pointed leaves and a more complicated, often much branched inflorescence. The peduncle is usually encased in a series of overlapping scarious or chaffy bracts, similar though smaller bracts subtend the branches of the inflorescence, while the bracts subtending the individual flowers are often scarious or partly so, particularly in the more southern forms of the species. Owing to the crowding of the flowers, especially on the branches of the inflorescence, the bracts are often closely

imbricating, from which feature the specific epithet was derived. The floral structure also shows differences, especially the labellum which is distinctly trilobed with the lateral lobes more or less sharply defined from the middle lobe. In some of the northern forms, however, the distinction is not so marked, the sinuses between the lobes being rather small.

On the basis of the combinations of various characters it is possible to distinguish four groups occurring in different geographical areas and consequently best treated as subspecies. These are as follows :—

subsp. **imbricata**

P. oligophylla Schltr. in Engl. Bot. Jahrb. **53**, 566 (1915).

Type specimen :—Upper Zambesi, cult. *J. O'Brien*.

The typical subspecies is the most southerly in distribution, occurring in the southern parts of Tanganyika Territory, Nyasaland, and Southern Rhodesia and possibly also in Mozambique and the northern Transvaal though I have seen no localised specimens from these areas.

It is characterised by the much branched inflorescence with numerous scarious basal sheaths and main bracts and also by the individual floral bracts being broad and often scarious. The labellum is distinctly trilobed (more so than in subsp. *kraenzlinii*) with well-developed lateral lobes. The stems (including the inflorescence) reach an average maximum height of just over 20 cm., extra tall stems reaching over 30 cm. The longest leaves vary between 10 and 20 cm. in length with an average of about 15 cm.

subsp. **kraenzlinii** (*Rolfe*) *Summerhayes*, stat. nov. ; a subspeciei typica inflorescentiis minus ramosis, labello obscure trilobato differt.

P. kraenzlinii Rolfe in Dyer, Fl. Trop. Afr. **7**, 112 (1897).

Type specimen :—Tanganyika, Usambara, *Holst* 8748.

This subspecies seems to be confined to the Usambara Mountains in north-eastern Tanganyika but it may also occur in the Uluguru Mts. farther to the south.

It may be distinguished from subsp. *imbricata* by the simple inflorescence with few more distantly spaced branches and the less distinctly trilobed labellum. In this respect it approaches *P. transvaalensis* Schltr., but in leaf characters and the occurrence of scarious sheaths and main bracts it agrees with the other subspecies of *P. imbricata*. The leaves also do not blacken much on drying. In stature the subspecies equals the type subspecies but the leaves are on the average slightly shorter.

subsp. **musozensis** (*Rendle*) *Summerhayes*, stat. nov. ; a subspeciei typica planta et foliis majoribus, inflorescentiae ramis distantibus, labello longiore quam lato basi setuloso-pubescenti differt.

P. musozensis Rendle in Journ. Linn. Soc. Lond. Bot. **37**, 217 (1905).

Type specimen :—Uganda, Musozi, *Bagshawe* 80.

This subspecies is northern and western in distribution, occurring in S. Tomé, Principe, the Belgian Congo and Uganda. It is possible, however,

that two subspecies are involved here, one from the islands of the Gulf of Guinea and the other in the eastern mountains of the Belgian Congo and in Uganda. I have seen so little flowering material of the former that I am unable to confirm this distinction.

In subspecies *musozensis* the labellum is distinctly trilobed, as in the typical subspecies, but it is usually considerably longer than broad with a relatively long claw which bears long rather bristly hairs at the base. The Uganda plants are considerably taller than in the more southern subspecies (average maximum height 35 cm.—tallest stems exceeding 50 cm.) with longer leaves reaching an average maximum of 20 cm. The S. Tomé and Principe plants are smaller, about the same size as subsp. *imbricata*. In all the plants the inflorescence branches are distant, forming a longer looser panicle than in the typical subspecies.

subsp. ***angustifolia*** *Summerhayes*, subsp. nov. ; a subspeciei typica caulibus \pm pendulis gracilibus usque ad 90 cm. longis supra basin caulis praecedentis exorientibus, foliis lanceolato-linearibus apice longe acuminatis vel acutissimis usque ad 18 cm. longis et 1.2 cm. latis differt.

Type specimen :—British Cameroons, Buea, 900 m. alt., July 1947, Gregory 165.

This subspecies is so far known only from the Cameroon Mountain in West Africa. It is characterised by the long flexuous pedulous stems each arising some distance above the base of the previous stem and bearing up to eight long very narrow and acute leaves. The branches of the inflorescence are distant and often branched again ; sometimes these branches arise on the leafless stems from the axils of the fallen leaves. The sheaths at the base of the inflorescence are not quite so well developed as in other subspecies of *P. imbricata*. The labellum is rather broad and distinctly trilobed, much as in the typical subspecies. The leaves blacken more in drying than in other subspecies but not so markedly as in *P. transvaalensis* Schltr.

Polystachya (sect. ***Caulescentes***) ***transvaalensis*** Schltr. in Engl. Bot. Jahrb. **29**, Beibl. 1, 28 (May 1895).

P. nigrescens Rendle in Journ. Bot. Lond. **33**, 200 (July 1895).

P. rendlei Rolfe in Dyer, Fl. Trop. Afr. **7**, 112 (1897).

P. natalensis Rolfe in Dyer, Fl. Cap. **5**, iii. 65 (1912).

This species is clearly closely allied to *P. imbricata* Rolfe, to which species it was referred by Kraenzlin, but differs in the shape of the leaves, the nature of the inflorescence, the less markedly trilobed labellum and the much greater blackening of the plant on drying.

The leaves in *P. transvaalensis* are on the whole shorter and relatively broader than in *P. imbricata* and are more neatly rounded at the apex ; they show very little narrowing in the upper part. In plants from Uganda, formerly referred to *P. nigrescens* Rendle, the leaves are narrower on the whole than in plants from farther south, but the difference is not great or constant enough to justify the separation of a sub-species.

The inflorescence is more simply constructed than in *P. imbricata* though it can sometimes bear a considerable number of flowers. Often

it appears as a simple raceme though suppressed lateral branches can usually be discovered near the base ; in other plants a number of short lateral branches are developed. There is usually only one or rarely two rather small sheaths on the peduncle while the bracts subtending the branches of the inflorescences are relatively small and not chaffy as in *P. imbricata*. The flowers are not so crowded and the bracts subtending them are therefore not so close together and imbricated as in the other species. Like the main bracts they are stiff and foliaceous rather than thin and chaffy.

There is considerable variation in the size of the flowers, in the length of the mentum and in the shape of the labellum. The latter is typically only obscurely trilobed with the broad rounded lateral lobes passing almost imperceptibly into the triangular or ovate middle lobe. In a few plants, however, the sinuses are rather more developed though never to the same extent as in *P. imbricata*.

I can see no justification for the separation of *P. natalensis* Rolfe as a distinct species. The drawing of the type specimen in the Kew Herbarium agrees in all essential respects with *P. transvaalensis* and other specimens from Natal are clearly conspecific with Transvaal material. The differential characters mentioned by Rolfe are either characteristic of *P. transvaalensis* (obtuse leaves) or can be found in specimens of that species (almost undivided labellum with obtuse apex).

P. transvaalensis is now known from the eastern mountains of the Belgian Congo, Uganda and Kenya Colony in the north, southwards to the Transvaal and Natal. It has so far not been found in the western parts of Africa.

Polystachya (sect. **Caulescentes**) **polyphylla**, *Summerhayes*, sp. nov. ; a *P. imbricata* Rolfe caulibus magis foliatis, inflorescentiae ramis \pm fractiflexis, floribus paulo majoribus et carnosioribus, labello distincte trilobato lobis lateralibus ex intermedio angulo fere recto vel acuto divergentibus satis differt.

Herba terrestris, usque ad 60 cm. alta, glaberrima. *Caules* caespitiosi, erecti, basi radices numerosas flexuosas ramosas griseas 1-2 mm. diametro emittentes, supra basin vaginis paucis obtusis vel acutis vestiti, superne usque ad 16-foliati, inferne 3-4 mm. diametro. *Folia* e basi vaginante suberecta vel patentia, linearia, lineari-ligulata vel lineari-lanceolata, apice obtusa, acuta vel brevissime bilobulata, 4-15 cm. longa, 5-15 mm. lata, tenuiter coriacea, nervis subtus prominulis. *Inflorescentia* terminalis, pauciramosa, usque ad 17 cm. longa ; pedunculus brevis, vagina arcta scariosa vestitus ; rami suberecti, usque ad 7 cm. longi, dense multiflori, rhachide \pm fractiflexa subangulata ; bractae patentēs, deltoideae vel late ovatae, apice \pm acuminatae, 1-4 mm. longae. *Flores* arcuatim patentēs, albi ; pedicellus cum ovario gracilis, 6-9 mm. longus. *Sepalum* intermedium anguste lanceolatum, acutum, concavum, 8-9.5 mm. longum, 2.5-3.5 mm. latum ; sepala lateralia oblique anguste triangularia, acuta, margine postico (superiore) 10-11 mm. longa, basi 5.5-6.5 mm. lata, cum pede columnae adnata mentum rotundato-conicum circiter 5 mm. longum formantia ; omnia sepala subcarnosa, tri- vel subquinquenervia. *Petala* subspathulatim oblanceolata, apice acuta vel

subacuta, 6–7.5 mm. longa, circiter 2 mm. lata, tri- vel subtrinervia. *Labellum* valde recurvatum, supra medium distincte trilobatum, 8–9 mm. longum, explanatum 4.5–6.5 mm. latum, carnosum ; lobi laterales erecti, rotundato- vel subacute triangulares, ex intermedio divergentes sinu angulo fere recto vel minore acuto ; lobus intermedius lanceolatus vel ovato-lanceolatus, acutus, 3–4 mm. longus, 1.8–2.7 mm. latus ; discus infra medium callo brevi antico rotundato vel leviter emarginato instructus. *Columna* brevis, crassa, apice truncata.

FRENCH CAMEROONS. Yaoundé, March 1940, *Jacques-Félix* 5071 ; same locality, on turf between rocks, Aug. 1939, *Jacques-Félix* 4840.

GABON. Between the Woleu and Ntem Rivers, Bengo, in turf among the rocks of Coss, May 1933, *Le Testu* 9126 (type) ; same area, in turf among the rocks of Molayop, May 1933, *Le Testu*.

This species, though evidently allied to *P. imbricata* Rolfe, appears to differ sufficiently in a number of correlated characters to deserve specific distinction. It is a tall rather stiff growing plant with very leafy stems, comparable in this respect with *P. rhodoptera* Rchb. f. The main differential characters from *P. imbricata* are given in the diagnosis. All the habitats mentioned are the same, namely, areas of turf between rocks, probably in rock masses. *P. imbricata*, on the other hand, usually occurs as an epiphyte, though there are a few records of it occurring on rocks in forests.

A specimen from the island of Principe (*Rozeira* 1941) is probably referable to this species but has rather shorter and broader leaves. In inflorescence and floral characters there is good agreement ; it also seems to be a terrestrial plant.

Polystachya (sect. **Elasticæ**) **geniculata** *Summerhayes*, sp. nov. ; a *P. pseudodisa* Kraenzl. planta graciliore, sepalis prope apicem haud dorsaliter cuspidatis, labello basi ecarinato apice breviter bilobato satis distinguenda.

Herba terrestris, 30–50 cm. alta ; caules approximati, basi in pseudobulbis anguste conicis 2.5–4 cm. longis 5–10 mm. diametro incrassati, radices flexuosas griseas emittentes, 3–5-foliati. *Folia* \pm recurvata vel patentia ; lamina lineari-ligulata vel lanceolato-ligulata, apice subacuta vel obtusa, brevissime bilobulata, sectio \pm V-formis, 10–16 cm. longa, 5–8 mm. lata ; vagina primo arcta demum laxior, 2–3 cm. longa, laevis. *Inflorescentia* terminalis, erecta, racemosa, 25–45 cm. alta, superne multiflora ; pedunculus teres, inferne vaginis 3–4 arctis acutissimis fere omnino vestitus ; rhachis teres vel leviter angulata, 4–15 cm. longa, 1–2 mm. diametro, pubescens ; bracteae breves, lanceolatae, acuminatae, usque ad 3 cm. longae, erecto-patentes. *Flores* erecto-patentes, flavidi vel pallide purpurei ; pedicellus cum ovario circiter 5 mm. longus, breviter pubescens. *Sepalum* intermedium erectum vel \pm incurvatum, ovatum vel oblongo-ellipticum, valde concavum, 2.75–4.25 mm. longum, 1.75–3 mm. latum, trinervium ; sepala lateralibus oblique ovata vel triangulari-ovata, apice apiculata vel breviter acuminata, margine anteriore 3.2–5.5 mm. posteriore 5.5–7.5 mm. longa, basi 4–5.5 mm. lata, cum columnae pede connata mentum late conicum rotundatum 3.5–4.75 mm. longum formantia, 3–4-nervia. *Petala* cuneato- vel oblongo-oblancoolata, apice obtusissima, 2.5–3.5 mm. longa, 1–1.7 mm. lata, uni- vel subtrinervia.

Labellum infra medium valde geniculatum, ex ungue angusto late ligulatum, medio leviter dilatatum, apice bilobatum, lobis leviter divergentibus rotundatis, in toto 6.5–8.5 mm. longum (explanatum), 1.5–2.7 mm. latum, medio pulvino pilorum densorum instructum, parte apicali (lobis inclusis) sparse breviter pubescens. *Columna* brevis, circiter 1.5 mm. longa; androclinium leviter excavatum; anthera hemisphaerica, antice triangulariter producta; rostellum productum, apice \pm truncatum.

BRITISH CAMEROONS. Mamfe, terrestrial between rock slabs, May 1947, *Gregory* 124 (type); same locality, Sept. 1948, *Gregory* 323; Mamfe, Banyang, 150 m. alt., on outcrop of granite rocks among *Microdracoides squamosus*, Aug. 1947, *Eyekh* FHI. 22304 (Forest Herbarium, Ibadan); Manenguba Mts., 1800 m. alt., in marshy grassland, June 1948, *Gregory* 302.

This species, which appears from the floral structure to be a characteristic member of sect. *Elasticae*, is probably most closely allied to *P. pseudo-disa* Kraenzl. Like that species it has a tall inflorescence, reaching to a height of 50 cm., while it also resembles Kraenzlin's species in being associated with a woody Cyperaceous species. In this case, however, the associate is *Microdracoides squamosus* Hua whereas *P. pseudo-disa* grows with *Catagyna pilosa* (Benth.) Hutch.

P. geniculata differs from *P. pseudo-disa* in its more slender stems, by the flowers appearing with the leaves and in the structure of the flowers. The sepals of the present species lack the cusp near their apex so characteristic of several species in the section. The labellum is comparatively simple in structure though bent sharply like a knee in the centre. The whole middle part is covered by a dense cushion of yellow hairs, while the apical part is sparsely and shortly pubescent. The apex itself is lobed with the lobes sometimes diverging, but there is some variation in this respect. There is also no sharp division into different parts as in some other species of the section.

Polystachya (sect. **Eurychilae**) **eurychila** *Summerh.* in *Kew Bull.* 1939, 492.

P. longi Chiov. in *Bull. Ort. Bot. Nap.* 15, 81 (1941).

On examination of the type specimens of the above two concepts, that of the latter being loaned for examination by the kindness of Dr. R. Pichi-Sermolli, there is no doubt that they represent the same species. In vegetative characters, the nature of the inflorescence and the structure of the flowers the two are almost identical.

The known distribution of *P. eurychila* is extended considerably to the north by the above reduction to synonymy as the species had been recorded only from Uganda and Kenya. It is now known from Western Abyssinia and may possibly occur in other parts of that country.

Polystachya (sect. **Calluniflorae**) **adansoniae** *Rchb. f.* in *Flora*, 48, 185 (1865).

P. albo-violacea Kraenzl. in *Engl. Bot. Jahrb.* 17, 50 (1893).

P. dusenii Kraenzl. l.c. 19, 250 (1894).

P. nigerica Rendle, *Cat. Talb. Nig. Pl.* 103, t. 13, fig. 5–9 (1913).

For some time I have been doubtful of the distinctness of the first two of the above concepts though I had kept them separate when writing the

Flora of West Tropical Africa. At that time I reduced *P. dusenii* and *P. nigerica* to *P. albo-violacea* as I could see no differences between these three concepts. I thought, however, that *P. albo-violacea* could be distinguished from *P. adansoniae* by the much larger and differently shaped lateral lobes of the labellum and the smaller middle lobe. In addition *P. albo-violacea* seemed to be restricted to West Africa as far east as Gabon whereas *P. adansoniae* was found in the forests of East Africa and in Angola.

Recently, when working on the genus *Polystachya* for the second edition of the Flora, I have carried out a much more extensive study of this group, of which I have seen nearly 60 gatherings. As a result I find that the differences given above are not sharply defined, many plants having labella of intermediate structure. Examination shows that there is, nevertheless, a sort of cline in the labellum character, the "*adansoniae*" type of labellum, with short rounded lateral lobes and relatively long middle lobe being restricted to the east, in Kenya, Tanganyika and Uganda, whereas the typical "*albo-violacea*" labellum, with much larger somewhat quadrate lateral lobes and relatively small middle lobe is best developed in West Africa. In Uganda the *adansoniae* type is mixed with a high proportion of intermediate types; these latter also occur elsewhere in East and West Africa and also in Angola. But even in West Africa and in Kenya, where the two extreme types are best developed, there is considerable variation in the labellum structure linking the most extreme types on each side with the obvious intermediates already mentioned. In fact it is quite impossible to draw any line of demarcation between the two types. Irrespective of the structure of the labellum, all the parts seen by me agree closely as regards the vegetative characters, the nature of the inflorescence and the structure of the other parts of the flower. I am consequently considering the two concepts to be conspecific, the earlier name *adansoniae* being the correct one for the united concept.

The species as now understood occurs from French Guinea in the west to the Cameroons and Gabon, in Angola, from which country it was originally described, in the eastern mountains of the Belgian Congo (where it is represented by the variety *elongata*), in Katanga, and in Uganda, Kenya Colony and Tanganyika. It may be distinguished from *P. stuhlmannii* Kraenzl. by the larger flowers in which the lateral sepals are caudate acuminate and by the much larger rounded lateral lobes and long narrow middle lobe of the labellum.

Polystachya (sect. **Polystachya**) **oblanceolata** Summerhayes, sp. nov. ; a *P. dolichophylla* Schltr. planta multo minore, foliis angustioribus apice acutissime 2-3-lobulatis, inflorescentiis simplicibus, sepalorum mento duplo brevior, labello indiviso oblanceolato apice abrupte acuminato facile distinguenda.

Herba epiphytica, nana, usque ad 7 cm. alta; caulis erectus, 2-3 cm. altus, basi vaginis 1-2 arctis apice acutis vestitus, superne 2-3-foliatus, basi radices leviter flexuosas verosimiliter appplanatas taeniales usque ad 4 mm. latas emittens. Folia suberecta vel leviter divergentia, lanceolato-lineararia vel anguste lanceolata, apice acutissime 2-3-lobulata, basi vaginantia, 2-5.5 cm. longa, 3-4 mm. lata, textura chartacea, costa

subtus prominula, siccitate subnigrescentia. *Inflorescentia* terminalis, simpliciter racemosa, 4-4.5 cm. longa, apice dense 5-8-flora; pedunculus infra medium vagina lanceolata acuminata 6-9 mm. longa instructus, sub vagina anguste bialatus, superne teres, ut rhachis teres dense pubescens; bracteae \pm patentes, lineari-lanceolatae, acutissimae, usque ad 4 mm. longae. *Flores* suberecti, de colore nil constat; pedicellus cum ovario 1.5-3 mm. longus, dense pubescens. *Sepalum* intermedium lanceolatum, apice acuminatum, 7 mm. longum, 1.75 mm. latum, trinervium; sepala lateralia oblique lanceolata, acutissima, margine antico (inferiore) 7.3 mm. longa, basi 1.75 mm. lata, cum pede columnae adnata mentum brevem rotundatum 0.6-1.2 mm. longum formantia, subquinenervium; omnia sepala extra dense pubescentia. *Petala* curvatim oblanceolato-lineariter, acuta, 5 mm. longa, 0.75 mm. lata, uninervia, glabra. *Labellum* ambitu oblanceolatum, apice in acumine satis longo subito angustatum, 5 mm. longum, fere 2 mm. latum, marginibus superne undulato-crenulatis, disco callo basali postice rotundato antice bilobato instructo ceterum dense farinaceo-puberulo. *Columna* brevis, 0.5 mm. longa, apice truncata. *Capsulae* obovoideo-fusiformes, 6-7 mm. longae, fere 3 mm. diametro.

FRENCH GUINEA. Mt. Gangan, near Kindia, May 1955, *Roberty* 17764.

This charming little species seems best placed in sect. *Polystachya* though it shows some resemblances to species in sects. *Calluniflorae* and *Affines*. It seems closest to *P. dolichophylla* Schltr., taking the floral structure and general growth characters into consideration, but the two species are very unlike both as regards size and other features.

The shape of the labellum is rather exceptional for the genus, being quite entire with the basal part narrow; in most other species with simple labella the lower half is the widest part. The very hairy flowers and extremely short mentum recall many species in sect. *Affines* but in other features there is no agreement.

***Bulbophyllum flexiliscapum* Summerhayes, nom. nov.**

B. graciliscapum Summerh. in Kew Bull. **1953**, 579 (1954), non H. Perrier.

Owing to the existence of *B. graciliscapum* H. Perrier, a Madagascan plant, the epithet cannot also be used for the Gabon species cited above. I am therefore substituting for it the epithet *flexiliscapum* which refers to the flexuous nature of the very slender scape.

***Eulophia malangana* (Rchb. f.) Summerhayes, comb. nov.**

Lissochilus malanganus Rchb. f. in Flora, **65**, 533 (1882).

This rather striking species is quite unlike *E. paivaeana* (Rchb. f.) Summerh. (*Lissochilus krebsii* sensu Rchb. f. loc. cit.) with which Reichenbach compares it. Rather is it allied to *E. caricifolia* (Rchb. f.) Summerh. and other similar species, with which it has the markedly spatulate petals and general labellum shape in common, but differs in the orbicular-elliptical relatively short petals.

***Angraecum* (sect. *Conchoglossum*) *erectum* Summerhayes, sp. nov.;** ab *A. curvicauli* Schltr. perianthii segmentis longioribus angustioribusque,

labello magis acutato, calcar longiore apice haud dilalato sed supra medium leviter inflato tantum satis differt.

Herba epiphytica, semi-scandens, omnino glabra ; caulis erectus, simplex vel pauciramosus, usque ad 60 cm. altus, 2–4 mm. diametro, fere per totam longitudinem foliatus et radices flexuosas griseas emittens. *Folia* disticha, patentia vel erecto-patentia ; vagina arcta, leviter compressa, longitudinaliter pluricostata, 1–2.5 cm. longa ; lamina ligulata vel lanceolato-ligulato, apice inaequaliter acute vel obtuse bilobulata, lobulo longiore usque ad 1.3 cm. longo, lobulo brevior internum fere nullo, 2–8 cm. longa, 4–10 mm. lata, interdum sectio V-formis carnosula. *Inflorescentiae* ex axillis foliorum exorientes, patentes, solitaires, univariarius biflorae, foliis breviores saepius multo breviores ; pedunculus 5–22 mm. longus, basi vaginis 1–3 vestitus, gracilis ; bractea basi vaginans, ovata, acuta, 2–3 mm. longa. *Flores* albi, flavidi vel pallide salmonei ; pedicellus cum ovario saepius arcuatim deflexus vel decurvatus, 5–9 mm. longus. *Sepalum* intermedium reflexum, lanceolatum vel oblongo-lanceolatum, acutum, 7.5–14.5 mm. longum, 2.3–5 mm. latum ; sepala lateraliter deflexa, oblique lanceolata, acuta vel fere acuminata, 8–12.5 mm. longa, 1.7–3.4 mm. lata ; omnia sepala subquinque- vel subseptemnervia. *Petala* anguste lanceolata, acuta, 7–12.5 mm. longa, 1.7–3.5 mm. lata, quinquenervia. *Labellum* e basi lata columnam amplectente late lanceolatum, acuminatum, apice recurvatum, 6–11.5 mm. longum, explanatum 2.5–4.5 mm. latum, basi carina mediana humili instructum ; calcar \pm incurvatum, cylindricum, dimidio apicali paulo inflatum apice ipso angustatum, 13.5–23.5 (saepius 17–20) mm. longum, superne 0.8–1.4 mm. diametro. *Columna* brevis, crassa, 1.6–2 mm. alta, apice truncata, androclinio reclinato leviter excavato. *Anthera* transverse elliptica, antice truncata ; pollinia valde compressa, ambitu late pyriformia, 0.8–1 mm. longa, stipitibus duobus elliptico-oblongis deorsum sensim angustatis 0.5–0.6 mm. longis hyalinis, viscidibus duobus sed saepius per margines coalitis longitudinaliter semi-ovatis viridibus 0.5–0.6 mm. longis. *Rostellum* haud productum, profunde bifidum. *Capsulae* pyriformi-ellipsoideae, 2.5 cm. longae, 7 mm. diametro.

UGANDA. Karamoja, Kokumongolo, 1500 m. alt., in riverine forest, May 1939, Thomas 2894.

KENYA COLONY. Northern Frontier District, Mt. Kulal, 1770 m. alt., in forest, Oct. 1947, Bally 5632 ; Mt. Kenya, N.E. sector, on Meru-Embu road, 1410 m. alt., in dry scrub about a stream, fl. Oxford Bot. Garden Jan. 1951, Schelpe ; Laikipia, Rumuruti, March 1943, Copley 20A ; Elgeyo Escarpment, 1950 m. alt., in wooded river-bed, July 1936, Tweedie 379 ; 386 ; Nairobi, Kirichwe Kubwa, 1650 m. alt., in undershrub, Oct. 1938, Bally CM. 7532 (type) ; Mbagathi, S. of Nairobi, 1740 m. alt., Feb. 1949, Archer 14 ; Ngong-Mbagathi, 1680 m. alt., Oct. 1938, C.-van Someren 56 ; Ngong, 1800 m. alt., May 1932, Mainwaring 1859 (CM. 3105) ; Langata Forest, S. of Nairobi, 1800 m. alt., fl. Entebbe Bot. Gardens, Oct. 1955, Haddow ; Ruiri Falls, 18 miles E. of Nairobi, 1350–1500 m. alt., Oct.–Nov. 1938, C.-van Someren 51 ; C.-van Someren CM. 8455.

This is evidently a common species in central Kenya, especially around Nairobi. It is characterised by the erect stems which are usually found on the main trunks and branches of the trees. There is considerable variation in the size of the flowers and also in the length and degree of fleshiness of the leaves. The inflorescences are usually one-flowered but the Ruiri plants have often two flowers in the inflorescence. It is difficult to be certain from the material available, including both dried specimens and flowers in liquid preservative, whether there are two

separate viscidia or only one, but from the evidence it appears that there are two viscidia attached one on each side of the deeply cleft rostellum. These viscidia, however, adhere readily to one another by their adjacent edges and tend to come away together.

I have placed the present species in Schlechter's section *Conchoglossum* (Beih. Bot. Centralbl. **36**, ii. 157, 166-167 : 1918) characterised by him as possessing usually single-flowered inflorescences with short-stalked flowers, often with a central keel at the base of the labellum. Of the species mentioned by him three (*A. affine* Schltr., *A. viride* Kraenzl., non (Ridl.) Schltr. and *A. multinominatum* Rendle) are undoubtedly allied to the present species. Several other west and east African species also fall naturally into this group, namely, *A. stolzii* Schltr., *A. angustipetalum* Rendle and *A. chevalieri* Summerh. *A. egertonii* Rendle and *A. pyriforme* Summerh. are also possibly referable to this section. In Madagascar *A. curvicaule* Schltr. clearly belongs to the section as understood here.

It is not clear what Schlechter's views were regarding this section when he published his later classification of the genus (Fedde, Repert. Spec. Nov. Beih. **33**, 306-312 : 1925) since he was then primarily concerned with the Mascarene species of the genus. Of the two Mascarene species originally included by him in his section *Conchoglossum*, one, *A. baronii* (Finet) Schltr., was placed by him in sect. *Lepervenchea* while the other (*A. viride* (Ridl.) Schltr.) is not mentioned in his later paper ; Perrier de la Bâthie, however, places it in sect. *Boryangraecum*.

It is evident that Schlechter and Perrier de la Bâthie (Fl. Madag. Orch. **2**, 202-321 : 1941) differ considerably in their interpretation of Schlechter's classification, especially as regards the species with single-flowered inflorescences, apart from sect. *Pectinaria*. For instance, Perrier transfers *A. baronii*, mentioned above, from sect. *Lepervenchea* to sect. *Boroniangraecum*. On the other hand both authors include in sect. *Hildebrandtiangraecum*, characterised *inter alia* by several-flowered inflorescences, three species in which the inflorescence is usually 1- or rarely 2-flowered. These species seem to me to be more closely allied to the main part of Schlechter's section *Conchoglossum* and at least one of them, the only one I have actually seen, namely, *A. curvicaule* Schltr., should be transferred to that section, as already suggested above.

An interesting feature of sect. *Conchoglossum* is the development of single-flowered inflorescences in successive years from the same node, until the remains of as many as four inflorescences can be detected in the older parts of the stem. This is well shown, for instance, in *A. stolzii* Schltr., but Schlechter seems to have misinterpreted what he saw and describes the inflorescences as "fasciculatae vulgo ternatae" ; he later places the species in sect. *Hildebrandtiangraecum*. In fact it is easy to see that only one of the inflorescences at any point is that of the current year, the others having been developed in previous years.

The other character which I have found in all the species which I have examined is the presence of a low median keel in the basal part of the labellum just in front of the spur mouth, a character mentioned by Schlechter. It is not possible to say if this occurs in all species of this affinity as I have not seen some species which I suspect may belong to the section.

Diaphananthe divitiflora (Kraenzl.) Schltr. in Beih. Bot. Centralbl. **36**, ii. 98 (1918).

Listrostachys divitiflora Kraenzl. in Engl. Pflanzenw. Ost.-Afr. **C**, 158 (1895).

Mystacidium congolense De Wildem. Not. Pl. Utiles Congo, **1**, 151 (1903).

Diaphananthe congolensis (De Wildem.) Summerhayes in Bot. Mus. Leaflet. Harv. Univ. **12**, 101 (1945).

In my brief revision of the genus *Diaphananthe* (see reference above) I maintained the above as distinct species, partly because I had seen only the two type specimens and partly because of a number of specimens in the Kew Herbarium from East Africa which made me doubtful of the nature of specific distinctions in this group.

Since then I have seen further material from East Africa and also a third gathering from the Belgian Congo. Examination of all this material has now convinced me that two species are represented, one from the Belgian Congo, which has to bear the earlier name, *D. divitiflora* (Kraenzl.) Schltr., and the other from East Africa (Sudan, Uganda, Kenya and Tanganyika) which I am describing as a new species below (*D. lorifolia* Summerh.).

These species differ in both leaf and floral characters as well as occupying different geographical areas. In *D. divitiflora* the leaves are broader and tend to become wider in the upper part; the flowers are about the same size as in *D. lorifolia* but the labellum is distinctly longer than broad and the lamina is always longer than the spur. In *D. lorifolia* the leaves are narrower, and markedly strap-shaped with almost parallel sides. The labellum is usually, and often much, broader than long, often roughly pentagonal in outline so that the front is considerably narrower than the base, while the spur is usually distinctly longer than the lamina though sometimes it may be about the same length.

Diaphananthe lorifolia Summerhayes, sp. nov.; affinis *D. divitiflorae* (Kraenzl.) Schltr., a qua foliis pro rata angustioribus loriformibus lateribus parallelis, labello latiore quam longo, calcari laminam excedente satis differt.

Herba epiphytica, omnino glabra; caulis \pm pendulus, modice elongatus, foliatus, usque ad 15 cm. longus vel ultra, circiter 5 mm. diametro, inferne radices flexuosas ramosas griseas emittens. *Folia* disticha; vagina arcta, 1-1.5 cm. longa, longitudinaliter pluricostulata; lamina curvatum loriformis lateribus parallelis, apice inaequaliter subobtusely bilobulata, lobulo longiore usque ad 13 mm. longo lobulo brevissimo interdum vix evoluto, basi leviter angustata, tota 10-25 cm. longa, 1-2 cm. lata, subtus unicostata, subcoriacea. *Inflorescentiae* plures, pendulae, ex axillis foliorum exorientes, 8-15 cm. longae, per totam longitudinem floriferae, subaxe 10-16-florae; rhachis levissime fractiflexa, 1-2 mm. diametro; bractae breviter ochreae, obtusissimae, 1-3 mm. longae. *Flores* \pm patentes, albi, pallide flavi vel pallide salmonei, interdum roseo-tincti; pedicellus cum ovario 4-6 mm. longus. *Sepalum* intermedium leviter incurvatum, lanceolatum vel oblongo-lanceolatum, acutum, 5-8 mm. longum, 2-3 mm. latum, convexum; sepala lateralia patentia, oblique oblongo-lanceolata, acuta, 6-9 mm.

longa, 2.2-3.2 mm. lata, dorso praesertim superne longitudinaliter carinata; omnia sepala trinervia. *Petala* leviter incurvata, oblique vel leviter curvum lanceolata vel oblongo-lanceolata, acuta vel subacuta, 4.7-7 mm. longa, 1.7-2.6 mm. lata, marginibus leviter sinuatis vel crenulatis, tri-rarius binervia. *Labellum* e basi latiore quadratum vel late pentagonum, antice truncatum apiculo interjecto, 5-7.5 mm. longum, 6-8.5 mm. latum, ante ostium calcaris dente conico rotundato instructum; calcar incurvatum, ex ore pro rata angusto dimidio basali leviter angustatum, dimidio apicali fusiformi-dilatatum, 5-9.5 mm. longum, circiter 1.5 mm. diametro. *Columna* porrecta, 2-3.5 mm. longa, superne angustata, semi-teres, androclinio leviter excavato; anthera hemisphaerica, antice vix producta, polliniis ovoideis, stipitibus duobus superne leviter dilatatis quam polliniis paulo longioribus, viscidio communi parvo; rostellum productum, deflexum, anguste triangulare, acuminatum, viscidio amoto profunde bifidum; fovea stigmatica quadrata vel transverse oblonga.

SUDAN. Imatong Mts., ravine of Kineti River, 1500-1800 m. alt., June 1939, *Andrews* A 2022.

UGANDA. Mt. Elgon, Sipi, 1800 m. alt., *Snowden*; Mt. Elgon, 1500-1800 m. alt., April 1924, *Snowden* 969.

KENYA COLONY. East Transzoia, towards Cherangani Hills, 1800 m. alt., in wooded river-bed, Feb. 1934, *Tweedie* 171; Kaimosi, 1650 m. alt., at edge of forest, June 1942, *Tweedie* 588; Tala River, Sawmill, June 1953, *G. R. Williams* 617; Kericho, 1800-2100 m. alt., March 1933, *Gray* 98; Kiptiget, Dec. 1941, *Copley* 57; Itare River, Jan. 1940, *Copley in Bally* B409 (a); S.W. Mau Forest, Feb. 1937, *Gardner* 3625 (type).

TANGANYIKA TERRITORY. Uluguru Mts., N.W. side, 1650 m. alt., in mist forest, Nov. 1932, *Schlieben* 3001.

This species, which is clearly widespread in East Africa, is closely allied to *D. divitiflora* (Kraenzl.) Schltr. from which it differs by the characters given in the diagnosis. According to Mrs. Tweedie the leaves all spread in one plane, much as in many species of *Aërangis*. The colour of the flowers is described differently by almost every collector but the flowers have apparently a white or pale yellowish ground colour which is variously tinged with pink, producing often flesh- or salmon-coloured effects.

***Aërangis arachnopus* (Rchb. f.) Schltr.** in Beih. Bot. Centralbl. **36**, ii. 113 (1918).

Angraecum arachnopus Rchb. f. in Bonpl. **2**, 93 (1854).

A. biloboides De Wildem. Not. Pl. Utiles Congo, **1**, 144 (1903).

Aërangis biloboides (De Wildem.) Schltr. in Beih. Bot. Centralbl. **36**, ii. 114 (1918).

During the recent visit to Kew of M. Tournay of the Brussels Herbarium I was enabled to study the type specimen of *Angraecum biloboides* De Wildem., a species of which I had not previously seen authentic material. On comparison of this specimen with material of *Aërangis arachnopus* (Rchb. f.) Schltr. I cannot find any differences serving to separate them and I therefore consider them as conspecific.

A. arachnopus was previously known from the Cameroons and Gabon, and the distribution is now extended to the Belgian Congo. The species is characterised by the wide spacing of the flowers in the inflorescence, these being 3-5 cm. apart.

NOTES ON AFRICAN CELASTRACEAE : I

R. A. BLAKELOCK

Recent work has shown that in some species of African *Celastraceae* nomenclatural changes are required ; these are dealt with in this paper. Three new species of *Salacia* are also described.

The specimens cited below are at Kew unless otherwise stated ; those at Paris have been examined by Mr. R. W. J. Keay. The abbreviations U1, U2 etc., refer to the Provinces as delimited in the " Flora of Tropical East Africa " 1952.

Maytenus *H. B. et K.*

The African species of *Maytenus* form a critical group of polymorphic and widespread species, and have a correspondingly lengthy synonymy and confused nomenclature. There is insufficient evidence to say what this variability may represent genetically, and in a tropical woody genus, not of great economic importance, there is little likelihood of such evidence being forthcoming in the near future. The herbarium material, at Kew, the British Museum, the East African Herbarium, Nairobi, and in the Forest Herbarium, Oxford, certainly shows more variability than can reasonably be accounted for as merely individual or phenotypic within a few well-marked species. To attempt to assign a Latin name to every variant is to base species or taxa of other rank on single characters. To recognize a limited number of species and varieties which show a correlation of aril, inflorescence and to some extent other characters and to ignore minor variants, especially of leaf-shape, appears the best compromise for floristic work. In two of these species nomenclatural changes are needed and these are made below.

Maytenus* undatus (*Thunb.*) *Blakelock* comb. nov.

Celastrus undatus Thunb. Prod. 42 (1794).

C. cymatodes Spreng. ex Linn. Syst. Veg. ed. 16, **1**, 775 (1825).

C. lancifolius Thonn. ex Schum. et Thonn. Beskr. Pl. Guin. 132 (1827).

C. collinus and *C. dumetorum* Eckl. et Zeyher En. Pl. Afr. Aust. 119 (1835).

C. luteolus Delile in Ann. Sc. Nat. Ser. 2, **20**, 90 (1843).

C. laurifolius A. Rich. Tent. Fl. Abyss. **1**, 130 (1847).

Catha fasciculata Tul. in Ann. Sc. Nat. Ser. 4, **8**, 98 (1857).

Celastrus zeyheri Sond. ex Harv. et Sond. Fl. Cap. **1**, 456 (1859-60).

C. fasciculatus (Tul.) Boivin ex Hoffm. Pl. Mad. 12 (1881).

Gymnosporia rehmanni Szysz. Polyp. Discifl. Rehm. 34 (1888).

G. undata (Thunb.) Szysz. l.c. ; Davison in Bothalia **2**, 296 (1927).

G. lancifolia (Schum. et Thonn.) Loes. in Engl. Bot. Jahrb. **17**, 548 (1893).

G. luteola (Del.) Loes. and *G. zeyheri* (Sond.) Loes. in Engl. Bot. Jahrb. **17**, 548 (1893).

* For the proposed conservation of *Maytenus* H.B. et K. as a generic name see Taxon **3**, 196 (1954).

G. fasciculata (Tul.) Loes. in Engl. Bot. Jahrb. **19**, 232 (1895) ; Davison in *Bothalia* **2**, 297 (1927).

G. goetzeana Loes. l.c. **30**, 344 (1901).

Maytenus fasciculata (Tul.) Loes. and *M. lancifolius* (Thonn.) Loes. in E. & P. Pflanzenfam. **20B**, 140 (1942).

Gymnosporia maliensis Schnell in Bull. Inst. Franç. Afr. Noire **15**, 96 (1953).

Davison in *Bothalia* **2**, 296, 297 (1927) lists the South African synonyms under *Gymnosporia undata* Szysz. and *G. fasciculata* Loes.

Spineless shrub or small tree. Leaves without resinous threads on breaking. Inflorescence an unbranched fascicle without a common peduncle rarely with a common peduncle up to 2 mm. long. Aril a thin oblique cup covering about a quarter or up to the entire seed.

FRENCH GUINEA. Mali, 1950, Schnell 4822 (lectotype of *Gymnosporia maliensis* Schnell, Paris).

TOGO. Lome, 1900-2, Warnecke 335 (BM ; EA ; K).

BRITISH CAMEROONS. Mt. Mba Kokeka, Bamenda, 7,800 ft. Lightbody FHI 30111.

A.-E. SUDAN. Er Kowit, 15.5.1907, Brown 1167 ; Mt. Kineti, Imatong Mts., 9,000 ft., 30.12.1935, Thomas 1872 ; Er Kowit, Jebel Seila, Andrews 3587.

ERITREA. Vallée Mogod, 1400 m., 8.4.1892, Schweinfurth & Riva 1558.

FRENCH SOMALILAND. Dai forest, 4,500 ft., 2.2.1954, G. Popov 1319.

W. BRIT. SOMALILAND. Duwi, 3,700-4,200 ft., 21.10.1932, Gillett 4419 ; Libah Hele Range, Berdale Mt., 5,300-5,700 ft., 1.12.1932, Gillett 4684.

ETHIOPIA. Mt. Aber, near Adesela, 6.1.1840, Schimper 840 ; Lake Tana, 27.11.1937, Pichi-Sermolli 374 ; Gara Mulata Mt., Harar, 8,500 ft., 4.3.1933, Gillett 5352 ; S. Ethiopia, Mega, Mt. Delo, 6,400 ft., 10,200 and 10,600 ft., 28.1.1932, Gillett 14237, 14965 (EA ; K).

UGANDA. Ul, Arenga R., S.E. Imatong, c. 7,500 ft., 6.4.1945, Greenway & Hummel 7299 (EA ; K) ; U2, Ruizi Falls, Mbarara, June 1938, Eggeling 3643 ; U2, Ruizi R., 4,300 ft., 27.10.1950, Jarett 196 (EA ; K) ; U4, Lake Nabugabo, 3,700-3,800 ft., Dec. 1938, Chandler & Hancock 2503 ; U4, Butto, Aug. 1927, comm. Brasnett 121.

KENYA. K1, Duniyus, Matthews Range, 7,000 ft., 25.6.1944, J. Bally 16 ; K3, Burnt Forest, N. Tinderet, 8,000 ft., June 1934, Dale 3245 ; K4, Mukogodo, 6,000 ft., Sept. 1937, Porter 3740 (K ; EA) ; K4, near Nairobi, 15.1.1945, Van Someren 9503, 9505 ; K3 or K5 ?, S.E. Mt. Elgon, 6,500-7,500 ft., Jan. 1931, T. H. E. Jackson 342 (K ; EA) ; K6, Ngong Hills, 7,900 ft., 18.1.1953, Bally 8528 ; K7, Arabuko, R. M. Graham 1972, 2001 (EA ; K).

TANGANYIKA. T1, Nyambili, Mwanza, 3,800 ft., 17.3.1953, Tanner 1293 ; T1, Minziro Forest Reserve, Bukoba, Sept. 1950, G. Watkins FH 3262 (K ; EA) ; T2, Arusha Forest Reserve, 23.9.1943, Linderman 855 ; T2, Loikonoi (near Olmotonyi), Arusha District, 6,200 ft., June 1954, Eggeling 6820 (EA ; K) ; T3, Amani, Maramba, 18.11.1936, Greenway 4744 ; T3, S. bank of Pangani R. between Hale and Makinyumbe, 200 m., 1.7.1953, Drummond & Hemsley 3135 ; T4, Mukugwe River, Kibondo District, 4,400 ft., July 1951, Eggeling 6213 (K ; EA) ; T6, Uluguru Reserve above Morningside, Morogoro District, May & June 1953, Semsei 1189, 1273 (EA ; K) ; T6, Manyangu Forest, Liwale Valley, Nguru Mts., 600 m., 27.3.1953, Drummond & Hemsley 1840 ; T7, W. slopes, Mt. Rungwe and top of Porotos, 6,800 ft., 7,000-7,400 ft., 11.3. and 14.3.1932, St. Clair-Thompson 860, 1299 ; T7, Itavanda, Iringa District, 4,800 ft., July 1953, S. Paulo 229 ; Zanzibar, 1931, Vaughan 1041 (K ; EA), 1412, 1497, 1502, 1503, 1543, 1677 ; Zanzibar near Aerodrome, sea level, 20.9.1950, Williams 71.

PORTUGUESE EAST AFRICA. Moçambique, Manica e Sofala, Serra da Chinta, 24.8.1946, J. Simao (EA).

NYASALAND. Blantyre, 1895, Buchanan 6918.

RHODESIA. Zimbabwe Ruins, 1.7.1930, Hutchinson & Gillett 3327.

ANGOLA. Cuanza Norte, Camabatela, Gossweiler 7379 ; Cuanza Sul, Amboim to Novo Redondo, Gossweiler 4483.

MASCARENE IS. Iles Comores and Madagascar 1847-52 Boivin (iso-syntypes of *Catha fasciculata* Tul.) ; Madagascar, Nissobé [? Nossi-beé] Boivin ; N.W. Madagascar ; Pasandava-Bai, Kissimani and Nosi-bé, June 1879, Feb. 1880, Hildebrandt 3011, 3340.

S. AFRICA. Transvaal : Pilgrims Rest, 2.11.1950, *Story* 4005 ; Swaziland : Lebombo, N. of Stegi, 19.7.1936, *Verdoorn* 1673 ; Orange Free State : Westbury, 14.10.1934, *Galpin* 14020 ; Natal : Inanda, *Wood* 1312 ; E. Cape Colony : Uitenhage, Nov. 1835, *Ecklon* 933, *Zeyher* 855.

Despite the extreme variability in leaf-size, shape and in fruit- and flower-size this species is fairly readily distinguishable from any other tropical African *Maytenus* by the characters given above, especially in the absence or extreme shortness of a common peduncle. Its relationship to some other S. African species dealt with by Davison (l.c. supra) is very close especially with *M. procumbens* (Linn. f.) Loes. (*Celastrus procumbens* Linn. f. Suppl. 153 (1781)). This latter species is a procumbent shrub of the sea-shore and sand-dunes of S. Africa. The leaves have generally fewer (4–5) main lateral nerves and a deflexed margin with sharp serrations ; characters which are not matched in *M. undatus*. The pedicels articulated well above the base or near the middle, characteristic of *M. procumbens*, are occasionally found in tropical African material of *M. undatus*, such as : Tanganyika, T3, E. Usambaras, 700 m., 26.6.1953, *Drummond & Hemsley* 3024.

Maytenus ovatus (Wall. ex Wight & Arn.) Loes. in E. & P. Pflanzenfam. **20B**, 140 (1942).

var. **ovatus**.

forma **ovatus**.

Celastrus ovatus Wall. ex Wight & Arn. Prodr. 159 (1834).

Catha ovata (Wall.) Walp. Rep. **1**, 532 (1842).

Celastrus obscurus A. Rich. Tent. Fl. Abyss. **1**, 132 (1847).

Gymnosporia ovata (Wall.) Lawson ex Hook. f. Fl. Brit. Ind. **1**, 619 (1875).

G. addat Loes. in Engl. Bot. Jahrb. **41**, 302 (1908).

G. serrata (Hochst.) Loes. var. *niansiaca* Loes. l.c. 302.

G. obscurus (A. Rich.) Loes. l.c. **17**, 546 (1893).

Leaves usually coriaceous or subcoriaceous, 5–12 nerves prominent on both surfaces, apex obtuse to rounded, margin serrate or crenate-serrate. Inflorescence glabrous, 0.5–3.5 cm. long. Capsule 4–10 mm. long.

The only clear character which distinguishes this from f. *pubescens* is the glabrous inflorescence. This seems inadequate to maintain it as a variety with the same rank as var. *argutus*.

INDIA. Nilgiry, *Noton in Herb. Wallich*. 4308 (holotype : K).

ETHIOPIA. Mts. Kubbi and Semajata, 29.12.1837, 16.1.1838, *Schimper* 129 (isotype of *Celastrus obscurus* A. Rich.) ; Haar-Deher, Semen, 22.1.1862, *Steudner* 600 ; Gondar and vicinity, *Massey* 39 ; Addis Ababa, 9,000 ft., 29.11.1953, *Mooney* 5042 ; Adola, Sidamo, 39° E., 5° 55' N., 6,100 ft., 27.1.1954, *Mooney* 5642 ; Adola, Sidamo, 6,100 ft., 28.1.1954, *Mooney* 5648 ; Belita, Kaffa, 12 m. N. of Jimma, 6,700 ft., 18.10.1954, *Mooney* 6074.

UGANDA. U1, Napak, 7,000 ft., Feb. 1938, *Sangster* 414 ; U1, Napak, Karamoja, 7,500 ft., 28.5.1940, *Thomas* 3647 ; U1, Napak, Karamoja, 7,700 ft., June 1950, *Eggeling* 5911.

KENYA. K3, Olkalou, Hallowes Farm, 8,500 ft., 16.12.1948, *Bally* 6520 ; K4/K3, Kinangop Forest, 1.7.1926, *Munro* 1363 ; K3/K5, Mt. Elgon, 7,500 ft., Feb. 1932, *Lugard* 692 ; K4, Aberdare Mts., 1905, *James* ; K4, near Meru, 14.2.1922, *Fries* 1494 ;

K4, Mutha Hill, Aug. 1938, *Bally* 7405 ; K5, from Nandi to Mumias, 1900, *Whyte* ; K4/6, Chyulus, above 5,500 ft., 4.6.1938, *Bally* 7991 ; North Kenya, 7,500 ft., 5.8.1914, *Battiscombe* 843.

RUANDA URUNDI. Niansa Berg. 1700 m., *Kandt* 10 (EA, isotype of *Gymnosporia serrata* (Hochst.) Loes. var. *niansaica* Loes.).

This variety (or close relatives) is fairly widespread in the Old World Tropics, but its distribution outside Africa is beyond the scope of the present paper.

forma **pubescens** (*Schweinf.*) *Blakelock* stat. nov.

Celastrus arbutifolius Hochst. ex A. Rich. and var. *major* A. Rich. Tent. Fl. Abyss. **1**, 133 (1847).

C. atkaio A. Rich. l.c. 132.

C. schimperi Hochst. ex A. Rich. l.c. 132.

C. serratus Hochst. ex A. Rich. l.c. 131.

Gymnosporia arbutifolia (Hochst.) Loes. in Engl. Bot. Jahrb. **17**, 547 (1893).

G. atkaio (A. Rich.) Loes. l.c.

G. engleriana Loes. in l.c. 547.

G. serrata (Hochst.) Loes. l.c. and var. *steudneri* Engl. ex Loes. l.c. 546.

G. serrata (Hochst.) Loes. var. *pubescens* Schweinf. in Bull. Herb. Boiss. App. 2, 336 (1899).

G. filamentosa Loes. var. *brevistaminea* Loes. in Engl. Bot. Jahrb. **41**, 301 (1908).

Celastrus littoralis A. Chev. Expl. Bot. **1**, 129 (1920) nomen nudum.

Leaves usually coriaceous or subcoriaceous, 5–16 nerves usually prominent on both surfaces, apex obtuse or rounded, margin serrate or crenate. Inflorescence pubescent, 0.5–3.5 cm. long. Capsule 4–10 mm. long.

ARABIA. Yemen, Hille, Gebel Bura, 1.1.1889, *G. Schweinfurth* 279 (isosyntype of *G. serrata* var. *pubescens* Schweinf. ; type of forma *pubescens* (Schweinf.) *Blakelock*).

IVORY COAST. Bassin du Cavally, entre Tabour et Bériby, au bord de la mer, 16–17.1.1907, *Chevalier* 19944 (*Celastrus littoralis* Chev.).

N. NIGERIA. Bauchi Plateau, 1929, *Lely* P.111.

BRITISH CAMEROONS. Mokanda, 8,000 ft., Feb. 1931, *Maitland* 1326 ; Bamenda, 6,000 ft., Apr. 1931, *Maitland* 1496.

FRENCH CAMEROONS. Yaoundé, 800 m., 1890–4, *Zenker & Staudt* 23.

BELGIAN CONGO. Near Elizabethville, 31.7.1930, *Hutchinson & Gillett* 4117 ; entre Lulenda et Sake (Kivu), Feb. 1932, *Lebrun* 5049 ; Sake derrière le village de Nzuru, 6.8.1937, *Louis* 4934 ; entre Muguga et la Rumoka, Nov. 1937, *Lebrun* 8593 ; Musisi, Apr. 1946, *F. L. Hendrickx* (EA).

A.-E. SUDAN. Nagichot, Didinga Mts., 6,600 ft., 30.10.1941, *Myers* 14197.

ERITREA. Aidereso, 1245 m., 6.4.1892, *Schweinfurth & Riva* 1412 ; Mai Hinzi, 5.1.1901, *Pappi* 1389 (EA) ; Monte Metaten, 2500 m., 12.11.1902, *Pappi* 1527 (EA) ; Saraë, Gaza Gobo, c. 1900 m., 10.3.1902, *Pappi* 280 ; Sugli, Al Hills, 5,250 ft., lat. 10° 58' N., long. 48° 53' E., 16.11.1929, *Collenette* 300.

ETHIOPIA. Adoa, 25.5.1837, *Schimper* 118 (isotype *Celastrus schimperi* Hochst.) ; Mt. Aber, 14.1.1840, *Schimper* 832 (iso-syntype *Celastrus arbutifolia* Hochst. var. *major* A. Rich.) ; sine loc., 1844, *Schimper* 1908 (iso-syntype *Celastrus serratus* Hochst.) ; sine loc., 1853, *Schimper* 887 ; Tigré v. Begemder, 1863–8, *Schimper* 899 ; Bellaka, 7,000–10,000 ft.,

3.9.1854, *Schimper* 2246 ; sine loc., *Plowden* ; Prov. Hamasen, 1861, *Steudner* 601 ; Choa and Chiré, 1862, *Franqueville* ; Ankober, 1862, *Roth* 208, 209 ; Gaffat, Debra Tahrar, Apr. 1862, *Steudner* 806 (isotype of *Gymnosporia serrata* (Hochst.) Loes. var. *steudneri* Engl. ex Loes.) ; Djenda, 22.5.1862, *Steudner* 603 (isotype *Gymnosporia engleriana* Loes.) ; Amba Sea, 6,000 ft., 16.3.1856, *Pullen* 580 ; Adis Abeba [Addis Ababa], Jan. 1914, *Massey* ; Yuka, 7,000 ft., 9.3.1933, *Gillett* 5444 ; Quami, Gorgora, Tana, 5.3.1937, *Pichi-Sermolli* 375 ; Monte Jesus Tabor, Tana, 22.3.1937, *Pichi-Sermolli* 391 ; Agheremariam, Alghc, 5° 38' N., 38° 14' E., 1750–2100 m., 2.12.1932, *Gillett* 14573 (EA ; K) ; Mt. Yerer, near Bishoftu, 8,000 ft., 15.2.1954, *Mooney* 5764 ; Mogada Forest, Sidamo, 6,800 ft., 7.1.1954, *Mooney* 5472 ; Jimma, 6,200 ft., 7.10.1954, *Mooney* 5900.

SOMALILAND. Mt. Wobleh, 10° 15' N., 43° 17' E., 6.2.1933, *Gillett* 4985 (EA ; K).

UGANDA. Ul, Amua, West Madi, Mar. 1935, *Eggeling* 1644 ; U1, Mt. Rom, Chua, 6,500 ft., 1936, *Eggeling* 2381 ; U1, Agoro, Chua, 8,000 ft., Feb. 1938, *Eggeling* 3507 ; Timu Forest, Karamoja, 6,500 ft., 6.11.1939, *Thomas* 3215 ; U2, Mbarara Road, near Kabale, Kigezi, 6,000 ft., 16.3.1936, *Michelmores* 1341 ; U2, Rwamuchu, Kigezi, 6,000 ft., June 1949, *Purseglove* 2901 (EA ; K) ; U2, Kachwekano Farm, Kigezi, 6,700 ft., Omushaki Lukiga, 6,700 ft., July 1949, *Purseglove* 3022 (EA ; K) ; U2, Rubaya, Kigezi, 6,500 ft., 4.7.1945, *Thomas* 4279 (EA ; K) ; U2, Kachwenko Farm, Kigezi, 6,800 ft., Jan. 1950, *Purseglove* 3222 ; U2, Kamwezi, Kigezi, 5,000 ft., Feb. 1948, *Purseglove* 2589 ; U3, Mbale District, Kabururon, near Kare R., 7,000 ft., 17.12.1952, *Kiragga* 56 (EA) ; U3, near Sipi, N. Mt. Elgon, Oct. 1939, *Dale* U12 ; U4, near Mubende, 19.6.1945, *Thomas* 4128 (EA ; K).

KENYA. K3, Tarambass Forest, Kamasia District, 6,000–7,000 ft., Nov. 1930, *Dale* 2447 (EA ; K) ; K3, Sabatia, 7,250 ft., *R.M. Graham* 3045 (EA ; K) ; K3, Karati River near Naivasha, 6,500 ft., May 1932, *Dale* 2844 (EA ; K) ; K3/5, Mt. Elgon, 6,500–7,500 ft., Dec. 1930, *Jackson*, *Lugard* 278, 306, 306A, 678 ; K4, Nairobi, 14.10.1907, *Battiscombe* 88 ; K4, near Forest Station, 2300 m., 2200 m., 30.12.1921–1.1.1922, *Fries* 531, 663 ; K4, Coles Mile, c. 2000 m., 16.1.1922, *Fries* 939 ; K4, Mt. Kenya, Karati River, 27.5.1943, *Andrews* 4458 ; K5, from Nandi to Mumias, in Kavirondo, *A. Whyte* 1898 ; K5, Londiani District, Tinderet Forest Reserve, Camps 2 and 6, 20 and 29.6.1949, *Geesterman* 5049, 5239 ; K3/6, Mau Summit, 10,000 ft., 1930, *Mettam* 176 ; K7, Kwale, 1,300 ft., Apr. 1938, *Dale* 3865 (EA ; K).

RUANDA-URUNDI. Niansa Berg, 1700 m., *Kandt* 27 (EA, type of *G. filamentosa* Loes. var. *brevistaminea* Loes.).

TANGANYIKA. T1, Bukoba District, Biharamulo Road, 15.11.1948, *Ford* 846 ; T2, Oldeani, 26.4.1954, *Matalu* 3106 ; T3, Bushiri Estate, 30.7.1950, *Faulkner* 684 ; T4, 26 miles S. of Mbugwe (3° 15' S., 31° 15' E.), 4,000 ft., 29.7.1950, *Bullock* 3045 ; T5, Salamka Forest Reserve, Bereku, Kondoa District, 24.5.1954, *Matalu* 3134.

N. RHODESIA. Broken Hill, June 1920, *Rogers* ; Solwezi District, Mbulungu stream W. of Mutanda Bridge, 15.7.1930, *Milne-Redhead* 713 ; Chambesi R., 3,900 ft., 17.7.1930, *Hutchinson & Gillett* 3792 ; Kapustu River, Lukanga basin, c. 3,500 ft., 17.6.1932, *Trapnell* 2053 ; Nsumbu Isl., Lake Bangweolo, 2.9.1933, *Michelmores* 564 ; North of Chinge, 5.6.1933, *Michelmores* 388 ; Mwenge, Shiwa Ngandu, 4,900 ft., 20.9.1938, *Greenway & Trapnell* 5731 (EA ; K).

var. **argutus** (Loes.) *Blakelock* comb. nov.

Celastrus gracilipes Welw. ex Oliv. Fl. Trop. Afr. **1**, 361 (1868).

Gymnosporia gracilipes (Welw. ex Oliv.) Loes. and var. *argutus* Loes. in Engl. Bot. Jahrb. **17**, 541 (1893).

G. trothae Loes. l.c. **28**, 150 (1900).

G. ellenbeckii Loes. l.c. **41**, 298 (1908).

Maytenus gracilipes (Welw. ex Oliv.) Exell in Bol. Soc. Brot. **26**, 222 (1952) and Consp. Fl. Angola **2**, 4 (1954).

Leaves membranous, 5–11 generally c. 7 nerves, prominent on both surfaces, apex acute, margin serrate. Inflorescence glabrous (pubescent in many W. African specimens), 3 (rarely 1–2)–14 cm. long. Capsule 0.8–1.8 cm. long.

BRITISH CAMEROONS. Amba Bay, Dec. 1862, *Mann* 2153 ; Buea, 3,000–3,200 ft., Mar. 1929, *Maitland* 568, 571 ; Mimbia, 3,000 ft., Feb. 1931, *Maitland* 1309 ; below Buea, 2,800 ft., 10.4.1937, *Hutchinson & Metcalfe* 108 ; Nkom-Wum F.R., Bamenda, Apr. 1951, *Ujor* FHI 30068.

FRENCH CAMEROONS. Yaundé, 800 m., 1890-94, *Zenker & Staudt* 23, 770.

BELGIAN CONGO. Djugu, Ituri, Nov. 1931, *Lebrun* 3960 ; Lac Kirwa, Jan. 1938, *Lebrun* 9407.

A.-E. SUDAN. Agnargi, 6,000-7,000 ft., Imatong Mts., 14.6.1939, *Andrews* 1949.

ETHIOPIA. Djamdjam, Uorhe Mt., 30 miles W. of Addis Ababa, 8,000 ft., 5.3.1944, *Bally* 3084.

UGANDA. U1, Imatongs, 6,500 ft., 11.4.1933, *J. Smith* 18 ; U1, Lututuru, Chua near Rest Camp, Feb. 1938, *Eggeling* 3502 ; U2, Ruwenzori, 1893-94, *Scott-Elliott* 8028 ; Ruwenzori, 6,500 ft., 4.10.1905, *Dawe* 601 ; Musandama, Ruwenzori, 7,500 ft., 16.12.1925, *Maitland* 1049 ; U2, Mwenge, Toro, 5,000 ft., *Snowden* 73 ; U2, Budongo Forest, 3,600 ft., May 1932, *Harris* 100 (EA ; K) ; U2, Lutoto, Ankole, *Eggeling* 3168 ; U2, Mitano Gorge, N. Kigezi, 4,000 ft., *Purseglove* 2552 ; U3, Mt. Elgon near R. Namataba [?], 6,000 ft., 28.10.1916, *Snowden* 489 ; Mt. Elgon, Butadiri, 5,000 ft., Jan. 1918, *Dummer* 3723 ; U3, Bugishu, Bududa, 4,100 ft., July 1926, *Maitland* 1219 ; U3, Bufombo, Bugishu, Bududa, 4,100 ft., July 1926, *Maitland* 1219 ; U3, Bufumbo, Bugishu, 4,000-4,500 ft., Nov. 1932, *Chandler* 997 (EA ; K) ; U3, Butandiga, Bulambuli, 7,200 ft., 1936, *Eggeling* 2435 ; U3, Butandiga, Bugishu, 6,000 ft., 8.12.1938, *Thomas* 2560 ; near Bulago, W. Mt. Elgon, 7,000 ft., Oct. 1939, *Dale* U23 ; U4, Mile 10 Bombo Road, 3,850-3,900 ft., Jan. 1938, *Chandler* 2127 ; Kajarsi Forest, Entebbe Road, 3,900 ft., Oct. 1935, *Chandler* 1429.

ANGOLA. Golungo Alto, between Sange and Camilungo, *Welwitsch* 1357 (isotype of *Celastrus gracilipes* Welw. ; K ; BM.) ; Cuanza Norte, Cazengo Granja de S. Luis *Gossweiler* 4495.

NYASALAND. N. Nyasaland, Masuku Plateau, 6,500-7,000 ft., July 1896, *Whyte* 14.

Intermediates are known between var. *argutus* (Loes.) *Blakelock* and var. *ovatus*, but they are much less numerously represented in herbaria than either variety. The following are specimens of such intermediates :—

S. NIGERIA. Old Oyo, 24.2.1946, *Keay* FHI 16024.

ETHIOPIA. Abyssinia, Aug. 1841, *Quarten-Dillon & Petit* 496 ; Tigré or Begemder, 1863-8, *Schimper* ; Mt. Guniidubba, Tukur Dinghia, Gondar, 1800 m., 23.1.1937, *Pichi-Sermolli* 385 ; Zara Enda Michael, 16.3.1937, *Pichi-Sermolli* 2309.

UGANDA. U2, Ruwenzori E. side Albert Edward, Aug. 1893-4, *Scott-Elliott* 8057.

KENYA. K4, Mt. Kenya, 6,500-7,500 ft., *Rammell* 1057 (EA ; K) ; K4, S.W. Kenya, 7,000 ft., *Battiscombe* 1169 (EA ; K) ; K4, Marania near Meru, 7,500 ft., 30.4.1944, *Bally* 3523.

var. ***kurmaicus*** *Blakelock* nom. nov.

Catha spinosa Forsk. Fl. Aegypt. Arab. 64 (1775) non *Maytenus spinosus* (Griseb.) Lourt. & O'Donnell in *Natura* 1, 188 (1955).

Celastrus parviflorus Vahl Symb. Bot. 1, 21 (1790) nomen superfluum.

Gymnosporia spinosa (Forsk.) Christensen in Dansk. Bot. Arkiv. 4, 17 (1922) non Fiori in Agric. Colon. 5, Suppl. 2 (1912).

Leaves subcoriaceous 10-19 obscure main lateral nerves on each side of midrib, apex subacute to rounded, margin crenate-serrate. Inflorescence glabrescent or sparsely pubescent, 5-8 cm. long.

S. ARABIA. Yemen, Kurma, Mar. 1763, *Forskål* (holotype Copenhagen, isotype BM). The other S. Arabian specimens of this species examined are few in number and not very good material. None is a precise match for *Forskål's* specimen and they are not therefore included in var. *kurmaicus*. The present paper is not concerned with Asiatic species of *Maytenus* so they need not be dealt with here.

In addition to the varieties and form of *M. ovatus* discussed above there are a few specimens and descriptions which, although in other respects they could be included in *M. ovatus* var. *ovatus* f. *pubescens* are characterized by having the filaments distinctly longer than the petals. Some of these have already been given names, but their status appears quite uncertain.

Gymnosporia filamentosa Loes. var. *major* Loes. and var. *minor* Loes. in Engl. Bot. Jahrb. 17, 546 (1893).

G. buchananii Loes. l.c. **28**, 153 (1900).

Maytenus edgari Exell et Mendonça in Bol. Soc. Brot. Sér. 2, **26**, 223 (1952).

TANGANYIKA. T1, Ukerewe, Mwanza Prov., June 1932, *Rounce* 64 (EA ; K).

N. RHODESIA. Mwinilunga District by R. Matonchi, near dam, evergreen vegetation, spiny evergreen shrub 8-10 ft., leaves green, flowers creamy-white, disk yellow, 6.11. 1937, *Milne-Redhead* 3124 (holotype of *M. edgari* Exell et Mendonça); Mufulira, river-side bush, flowers white on drooping distal branches, 15.5.1934, *Eyles* 8332.

It is worth pointing out that sexual dimorphism is known in other genera of *Celastraceae*, but that the specimens with long filaments noted above are very few in number in comparison with those with normal flowers.

The species *M. ovatus* is recognizable by the aril which forms a thick cup-like strophiole below the seed. In the other tropical African species the aril is a thin oblique cup covering the basal quarter to the entire seed. A number of "species" have been described within this taxon, although the extreme examples are clearly marked intermediates are now represented in the herbarium material available.

The earliest name for this species is *Catha spinosa* Forsk. Forskål's specimen, kindly lent by the Universitetets Botaniske Museum, Copenhagen, and of which there is an isotype at the British Museum, has been examined. Unfortunately it bears no fruit but on comparison of its flowers and vegetative parts with other South Arabian, as well as with E. African material, there is no reason to doubt its being in this species.

The combination *Maytenus spinosus*, however, is preoccupied by *Maytenus spinosa* (Griseb.) Lourt. & O'Donnell (*Moya spinosa* Griseb.), an Argentine species. The publication of this combination only reached me while the present paper was in the press. The next name to be considered is *Celastrus parviflorus* Vahl. This is based on Forskål's *Catha spinosa* and is an illegitimate name. The next name in chronological order is then *Celastrus ovatus* Wall. ex Wight & Arn., which has already been transferred to *Maytenus* by Loesener. Although this involves introducing a name previously unused in the literature on the African flora, it seems unavoidable. To maintain the varieties listed above as separate species would be to ignore the intermediate specimens; to use one of the specific epithets already well known in African botany would be to ignore the earlier description and specimen. The rank of variety rather than that of subspecies is used above; the latter with its implication of geographical distinction, is not suitable as the African specimens of the species often differ more from each other than do many tropical African specimens from Indian or S. Arabian ones.

Salacia Linn.

In the descriptions below the square brackets [. . .] enclose measurements or other characters not shown in the type-gathering.

Salacia hispida sp. nov. ; a *S. togoica* Loes. et omnibus *Salaciis* africanis ramulis hispidis facile distinguitur.

Frutex scandens. *Ramuli* viridis deinde grisei, cortice interiore aurantiaco, subteretes in sicco \pm longitudinaliter irregulariter striati, scabri et hispidi, pilis patentibus violaceis in sicco nigris usque 2 mm. longis. *Folia* opposita vel subopposita, papyracea, ovata vel oblongo-elliptica, sine filamentis resinosis in foliis fractis, supra glabra atroviridia et nitida, infra pallide viridia et nitida, in sicco \pm griseo-olivacea, apice acuminata, margine serrato-dentata, ad basin subrotundata vel leviter cordato-auriculata, nervis supra subimpressis vel haud impressis infra \pm hispidis prominentibus nervis primariis lateralibus untrinsecus mediani 4-11, rete venularum supra inconspicuo infra conspicuo, 4.7-14 [24.5] cm. longa 2.2-6.8 [10.5] cm. lata; petioli ut ramuli hispidi, supra canaliculati, marginibus crispatis, 5-10 [17] cm. longi. *Inflorescentia* fascicularis, 1-6 fl. per axillam, sine pedunculo commune, pedicellis glandulososcapulis indumento in sicco pallide brunneo, 4-7 mm. longis; bracteae minutae triangulares. *Alabastrae* subgloboso-conicae apice rotundatae. *Flores* 5-7 mm. diam. *Sepala* 5, subaequalia, concava, suborbicularia vel triangulari-ovata, extra parce scabrida vel glabrescentia, intus glabrescentia, apice obtusa vel rotundata, margine integra, c. 1 mm. longa, c. 1 mm. lata. *Petala* 5, flavoviridia, oblongo-ovata, extra glabrescentia vel parce scabrida, intus glabrescentia, apice rotundata, margine minute irregulariter sinuato-dentata, 2-3 mm. longa, 1.5-2 mm. lata. *Discus* simplex, plano-convexus, 5-angulatus, glaber, griseus et brunneus, c. 2 mm. diam. *Antherae* aurantiaco-cinnabariniae transverse dehiscentes, c. 0.5 mm. longae. *Filamenta* flavo-viridia, revoluta, lineari-triangularia, complanata, glabra, c. 1 mm. longa. *Stylus* conicus, c. 1 mm. longus. *Ovarium* glabrum, 3-loculare. *Ovula* 2 pro loculo. *Fructus* ignotus.

BELGIAN CONGO. Yangambi, falaises de l'Isalowe, 27.8.1937, *J. Louis* 5869; Yangambi, 23.12.1937, *J. Louis* 7253 (EA).

S. NIGERIA. Benin, Okomu Forest Reserve, Compartment No. 66 (also seen in Comp. 69), climbing over a tree of *Sersalisia micrantha* in high forest, 28.1.1948, *J. P. M. Brenan* 8916 (Holotype in Herb. Kew).

The Congo specimens were distributed bearing an unpublished name attributed to the late Dr. Jean Louis. Mr. Brenan's notes on colour, leaf-texture have been incorporated in the description given above. His gathering shows smaller leaves with more cuneate leaf-bases than that of Dr. Louis, but despite this discrepancy and the absence of fruit the stiff dark spreading hairs form so unique a feature in any African *Salacia* that there is little doubt that the species is a very distinct one.

Salacia rhodesiaca *Blakelock* sp. nov.; a *S. howesii* Hutch. et. M. B. Moss ramulis densioribus tomentosis, foliis minus acuminatis, cymis brevioribus, antheris et stylis brevioribus differt.

[*Frutex* vel] arbor parva 3 [usque c. 6] m. altus, corona rotundata. *Ramuli* subteretes, in sicco longitudinaliter irregulariter striati, tomentosi vel dense pubescentes, in sicco brunnei. *Folia* opposita vel subopposita, coriacea, oblongo-elliptica vel elliptica, glabris (nervis exceptis), sine filamentis resinosis in foliis fractis, in sicco \pm griseo-viridia subtus pallidiora, apice obtusa, acuta vel rotundata [acuta vel parce acuminata], margine integra vel leviter sinuato-dentata, basin cuneata [vel rarius subcordato-auriculata], nervis primariis lateralibus utrinsecus mediani 6-11 supra basin versus parce pubescentibus subprominentibus infra

prominentibus et reticulatis costa parce pubescente rete venularum supra inconspicuo, infra conspicuo, 3·4–8 [13·3] cm. longa, 1·2–3·2 [4·8] cm. lata; petioli subteretes, tomentosi vel dense pubescentes, 2–4 [5] mm. longi. *Inflorescentia* cymosa ramosa 2–7 [12] fl., anthesin [5] 7–10 mm. longa, pedunculis tomentosis 1–2 [fructiferis 5] mm. longis, pedicellis tomentosis, 3–4 mm. longis; bracteae minutae \pm triangulares. *Alabastrae* subglobosae apice rotundatae. *Flores* flavi, c. 3 mm. diam. *Sepala* 5, subaequalia, concava, ovata vel triangulari-ovata, extra tomentosa, intus pubescentia, apice obtusa, margine integra, 1–1·5 mm. longa, 1–1·5 mm. lata. *Petala* 5, oblongo-ovata vel ovata, extra tomentosa, intus dense pubescentia indumento \pm 3-lineato, apice rotundata, margine integra, c. 2 mm. longa, c. 1·5 mm. lata. *Discus* simplex crassus, convexus glaber, basin sublobulatus, c. 1·75 mm. diam. *Antherae* 3, subsessiles, \pm longitudinaliter dehiscentes rimis c. 60° divergentibus, 0·75 mm. longae, filamentis quam antheris brevioribus, haud 0·5 mm. longis. *Stylus* conicus, obtusus, glaber 0·5 mm. longus. *Ovarium* pubescente 3-loculare. *Ovula* 2 pro loculo. [*Fructus* globosus, immaturus viridis glaucus, maturus rubro-brunneus, subverruculosus, apice rotundatus, 1-spermus, c. 2 cm. longus, 2–2·5 cm. latus. *Semen* ovoideum, exarillatum, in loculo laxo situm, 16 mm. longum 9 mm. latum.]

BELGIAN CONGO. Katanga, arbrisseau, 7.3.1917, *A. Ringoet*.

N. RHODESIA. Chivemba, "Mumpombwe", a common tree, March 1930, *O. B. Miller* 34 (FHO); Solwezi District, Mutanda Bridge, *Brachystegia* woodland, shrub 10 ft., 29.6.1930, *E. Milne-Redhead* 624; Solwezi District, Solwezi, *Brachystegia* woodland, shrub 10 ft., unripe fruits green with a glaucous bloom, 25.9.1930, *E. Milne-Redhead* 1201; Solwezi, Elizabethville, "Mupo", 14.5.1931, *D. Stevenson* 239 (FHO); 39 m. S. of Chitambo, 7.6.1931, *D. Stevenson* 318 (FHO); Lake Road, S. of Luwingu, straggly shrub, occasional in small groups in *Brachystegia* woodland, 25.8.1933, *A. P. G. Michelmore* 548; Mufulira, in open forest, small tree, leaves polished, fruit terminal red-brown, 21.5.1934, *Eyles* 8301; Mwinilunga District, Kuanda's, c. 4,500 ft., cap of loamy Kalahari sand on Congo-Zambesi watershed, small tree, Sept. 1934, *C. G. Trapnell* 8301; Lunzua, Abercorn, 5,300 ft., *Brachystegia* woodland, on red earth, small evergreen tree some 20 ft. high, March 1937, *C. G. Trapnell* 1713; in Improvement Felling Plot No. 2, Ndola West Reserve, small tree, 12–15 ft. with smooth bark and dark foliage, 24.4.1937, *R. G. Miller* 137 (FHO); Abercorn 8° 50' S., 31° 25' E., 5,500 ft., *Brachystegia* woodland, small tree with rounded crown, 15 ft., flowers yellow, very attractive to flies, 29.3.1930, *A. A. Bullock* 2743 (holotype in Kew Herb.; EA); Luanshya, shrub or small tree to 8–10 ft., leaning spreading from plateau woodland, leaves leathery, glabrous, young fruit glaucous-green, globose, 9.7.1954, *D. B. Fanshawe* 1353.

The apparent "tomentum" on the seed in *Milne-Redhead* 1201 has been examined by Mr. D. A. Reid, and is composed of fungal hyphae.

One flower from Ringoet's specimens showed only two stamens, presumably an abnormality; in other flowers there are three stamens as in the rest of the genus.

This species is very close to *S. howesii* from the Gold Coast and Nigeria, but grows in different ecological conditions, and in a drier climate. In *S. howesii* the cymes are 12–24 mm. long, the style 1–1·5 mm. long, and the filaments are 0·75–1 mm. long, being somewhat longer than the anthers or about as long and there are two ovules in each loculus.

S. howesii has been collected from two localities. The type specimen was from the Gold Coast: Anaje, 7 miles N.W. of Sekondi, 1.10.1925, *F. N. Howes* 974. This locality is within the zone of rain-forest climate. The second gathering is from Nigeria: Ondo Province, Akure Division, Orosun Mountain, Idanre, 760 m., in shallow soil on edge of bare rock-

face near margin of high forest, 2.1.1948, *R. W. J. Keay* 8682, also flowering in forest shade in high forest in main ravine, 30.10.1949, *Keay* 25514. According to the collector, although the patch of scrub in which *S. howesii* was growing would be difficult to classify vegetationally, it certainly showed no affinities with *Brachystegia* woodland.

Salacia tuberculata *Blakelock* sp. nov. ; a *S. erecta* (Don) Walp. ramulis crebre verruculosus, [fructu tuberculato], a *S. leonense* petiolis longioribus foliis nitidioribus nervis primariis numerosioribus anastomosantibus minus conspicuis, petalis oblongo-ovatis differt.

Frutex scandens, omnino glaber. *Ramuli* virides, [anguste 4-alati (alis usque 0.5 mm. latis)] vel 4-lineati, crebre verruculosi. *Folia* opposita vel subopposita, subcoriacea, ovata vel elliptico-oblonga, sine filamentis resinosis in foliis fractis, in sicco \pm olivacea, apice \pm acuminati, margine parce serrato-dentati, basin [cuneata vel] obtuso, nervis primariis lateralibus utrinsecus mediani 6–9 supra prominentulis infra prominentis rete venularum supra et infra conspicuo, 8.5–16.5 [3.5–19.5] cm. longa, [1.6] 2.3–8 cm. lata, petioli supra canaliculati, marginibus valde crispatis, 5–10 mm. longi. *Inflorescentia* fascicularis, 1–3-fl. per axillam, sine pedunculo commune vel pedunculo c. 1 mm. longo, pedicellis verruculosus 4–6 mm. longis, [fructiferis c. 2 mm. crassis]; bracteae minutae triangulares. [*Alabastrae* subgloboso-conicae apice rotundatae]. *Flores* virides 5–7 mm. diam. *Sepala* 5, subaequalia, concava, triangulari-orbicularia, apice rotundata, margine anguste hyalina fimbriato-dentata, c. 1 mm. longa, c. 1 mm. lata. *Petala* 5, oblongo-ovata, apice rotundata, margine subintegra, c. 3 mm. longa, c. 2 mm. lata. *Discus* simplex plano-convexus, 5-angularis, c. 2 mm. diam. *Antherae* transverse dehiscentes. *Filamenta* linearia, complanata, basin modice dilatata, 1–1.5 mm. longa. *Stylus* conicus, 0.5–0.75 mm. longus. *Ovula* c. 4 pro loculo. [*Fructus* ellipsoideus, tuberculatus, valde apiculatus, c. 11-spermus, 2.2–4.5 cm. longus, 1.5–c. 2 mm. latus. *Semina* irregulariter angulata, \pm complanata, in pulpa arcte investita, 8–12 mm. longa, 6–8 mm. lata.].

S. NIGERIA. Calabar, climber shrub 10–15 ft., Feb. 1863, *Mann* 2265 ; Oban, *Talbot* 1705 ; Oban, 1912, *Talbot* s.n. (BM) ; Eket District, 1912–13, *Talbot* 3186, 3198 (BM).

SIERRA LEONE. Near Bafodeya, Limba *Scott-Elliot* 5575 ; Yetaya, 1,100 ft., 23.9.1914, *N. W. Thomas* 2439 ; Njala, woody creeper, green flowers, 6.6.1927, *F. C. Deighton* 714 (K ; BM) ; Boma, climber, green flowers, 16.4.1939, *F. C. Deighton* 3720 ; Baiima (Jaluhun Chieftdom), climber, green flowers, 30.4.1940, *F. C. Deighton* 3951 (holotype in Kew Herb.) ; Roruks, climber in riverain forest, 13.5.1945, *F. C. Deighton* 4138 ; Gola Forest Bagbe B.III, small 10 ft. shrub, fruits 3-angled, green, vernacular name ngigbolei (Mende), 19.5.1952, *D. Small* 690.

BELGIAN CONGO. Yambata, Mar. 1914, *S. de Giorgi* (BM).

In *S. leonensis* Hutch. & M. B. Moss the petioles are 1–5 mm. long, the leaves usually elliptic-oblong, rarely ovate, generally narrower than in *S. tuberculata*, and in sicco more discoloured (paler below). The main lateral nerves are 4–6 on each side of the midrib, arising at an acute angle and towards the outside run more nearly parallel with the margin. The petals are suborbicular with a minutely and irregularly dentate margin.

***Salacighia* Loesener**

The following two new combinations require to be made in the genus *Salacighia* Loes.

Salacighia letestuana (Pellgr.) Blakelock comb. nov.

? *S. denudata* A. Chev. Bot. 133 (1920) (nomen nudum) ; Hutch. & Dalz. Fl. W. Trop. Afr. ed. 1, **1**, 453 (1927).

Salacia letestuana Pellegr. in Bull. Mus. Hist. Nat. Paris **28**, 312 (1922).

Salacighia malpighioides Loes. in Wissensch. Ergebn. Deutsch. Zentr.-Afr.-Exped. 1910-11, 77 (1922) (nomen nudum) ; in Fedde Repert **49**, 228 (1940) ; in Pflanzenfam. **20B**, 217 (1942) ; Exell & Mendonça Consp. Fl. Angol. **2**, 27 (1954).

Leaves opposite or subopposite ; petioles 10-15 mm. long ; calyx of 2-3 apiculate sepals covering corolla in late bud stage ; flower-buds apiculate ; petals lacerate.

S. NIGERIA. Eket Talbot (BM) ; Oban, 1911, Talbot 149 ; Calabar, Kwa Falls, in high forest near falls, scandent liane to c. 50 ft., stems purplish-brown, leaves subcoriaceous, deep green and glossy above, lower nerves rather impressed, paler green beneath, inflorescences on lateral leafless branch, stems up to c. 3 ft. long, divaricately branched, rising from main stem c. 6 ft. from ground, flowers pale green, petals with pale rose margins, disc cream, ovary pale green, 6.3.1948, Brenan 9249.

IVORY COAST. Adiopodumé, Nov., Mangenot (Paris).

FRENCH CAMEROONS. Dengdeng, 5° 10' N., 13° 35' E., 7,000-7,500 m., Mar. 1914, Mildbraed 8591.

GABOON. Nyanga, *Le Testu* 1907 ; *Le Testu* 5414, 5534 (both at Paris).

CABINDA (PORTUGUESE CONGO). Mayombe, a climbing shrub, flowers produced from liane, forests, Oct. & Nov. 1922, Dawe 279.

BELGIAN CONGO. Yangole 20 km. W. of Yangambi, 20.10.1938, J. Louis 11914 ; Yabahondo village, left bank of Lomami-Tisangi, Oct. 1954, R. Germain 8119.

The type specimen is cited by Pellegrin as "Mayombe bayaka. Liane. Fleurs très abondantes en inflorescences souvent ramifiées, jaune clair, surtout à la base. Feuilles seulement au sommet. Tchibanga, 8 décembre 1914 (L.T. 1907)".

S. linderi (Loes.) Blakelock comb. nov.

Salacia linderi Loes. ex Harms in Notizbl. Bot. Gart. Berlin **25**, 673 (1942).

Leaves alternate ; petioles 4-7 mm. long ; calyx of 4-5 sepals rounded at apex not covering corolla in late bud stage ; flower-buds not apiculate ; petals subentire.

SIERRA LEONE. Kambui, creeper, 20.3.1916, Lane-Poole 449.

LIBERIA. Moylakwelli-Totokwelli, liane, flowers honey-yellow, in panicles up to 3 ft. long, borne on lower parts of stem, 28.11.1926, Linder 1278 (isotype).

The R.H.S. Dictionary of Gardening Supplement.*—When the four volumes of the R.H.S. Dictionary were published in 1951, a fifth volume was promised to include new plants introduced into cultivation during the preparation of the Dictionary, and to contain lists of recommended varieties of plants. In addition it was to contain such corrections as

* Royal Horticultural Society, Supplement to the Dictionary of Gardening, ed. P. M. Syngé, pp. 334 (10 May 1956). Oxford : Clarendon Press. London : Cumberlege. 42/- net.

might be needed. The "Supplement"* now published is this fifth volume, and it comprises two parts: Part I contains the promised lists of recommended varieties of flowering plants, fruits and vegetables, with an article on Fertility Rules in Fruit Planting; while Part II contains the additions and corrections arranged alphabetically.

As was indicated in the review of the original work published in this Bulletin, 1952 p. 280-1, only the later part of the Dictionary could be critically revised, and hence it is to the first three volumes that the bulk of the Additions and Corrections (169 out of 198 pages) refer. The minor emendations are the sort one would expect—spelling mistakes, errors in references, alterations in nomenclature, and so on, but some articles have been completely re-written or very drastically revised, while keys are provided for some genera which previously lacked them. Moreover, some articles which were missing from the original work, for example those on "Planting" and "Pruning", are now supplied.

The treatment of physiological subjects is greatly strengthened by contributions from Professor R. N. Stoughton, and among other welcome additions are articles on Soils, Seed Sowing and Germination, Plant Breeding, Mineral Nutrition of Plants, Fertilizers, House Plants, and Plant Hormones. A very valuable feature is the International Code of Nomenclature for Cultivated Plants, which is printed in full, while the Dictionary is further enriched by instructional articles on such subjects as Correct Names, Botanical Keys ("Keys, Botanical, and How to Use Them"), the Identification of Plants, the Metric System, Pronunciation of Botanical Names, and Shapes of Leaves, all from the pen of the indefatigable "W.T.S." (William T. Stearn), to whom a great many of the other major and minor corrections and additions are due.

One may perhaps sum up the value of this "fifth volume" by saying that when using the R.H.S. Dictionary of Gardening it will always be wise to refer also to its Supplement.

Flora of Southeastern Washington.*—This revised edition of Professor St. John's excellent flora is a reprinting of the original (1937) text followed by 29 pages of additions and name-changes accepted by the author. Professor St. John now refers his *Euphorbia virgata* Waldst. et Kit. to *E. esula* L., adding *E. intercedens* Podp. non Pax, and *E. podperae* Croizat, to the synonymy. There are interesting comments on the new revision (1955) of the Lupins of the U.S.A. and Canada by L. L. Phillips, who has reduced the hundreds of taxa to 16 species! The earliest author of the combination *Cirsium vulgare* (Savi) was Tenore, see *Index Kewensis* Suppl. 11, not Airy Shaw (p. 558).

N.Y.S.

* Flora of Southeastern Washington and of adjacent Idaho. By Harold St. John. Pullman, Washington: Students Book Corporation, Revised Edition, 1956, pp. xxv, 561, ff. 11, map. Price \$4.25.

THE TAXONOMIC AFFINITIES OF SPHENOSTEMON IN THE LIGHT OF THE ANATOMY OF ITS STEM AND LEAF.

C. R. METCALFE

A. Introduction.

Sphenostemon Baill. is a genus comprising 3 species of shrubs or small trees from New Caledonia. It has generally been placed in the Aquifoliaceae, and this is the family in which it is retained in Loesner's monograph of the Aquifoliaceae in Engler and Prantl's "Die natürlichen Pflanzenfamilien" (4). Although he retains *Sphenostemon* in the Aquifoliaceae, Loesner is careful to emphasize that the genus has no true affinities with the family. He suggests, without giving reasons, that its affinities lie closer to the Ochnaceae or Theaceae, and expresses the view that the genus probably merits the status of a special family.

Before discussing the affinities of *Sphenostemon* any further, it is necessary to turn to two other genera, this time from New Guinea, of which the taxonomic affinities are also doubtful. These are *Nouhuysia* and *Idenburgia*. In 1952, Dr. C. G. J. van Steenis (5) concluded that *Idenburgia* and *Nouhuysia* are congeneric, and that *Nouhuysia*, as thus interpreted, should be placed in a new tribe the Nouhuysieae of the family Guttiferae. In arriving at this conclusion, he appears to have been influenced by the alleged occurrence of "distinct resinous ducts in the young leaves and tepals". Van Steenis quotes Professor G. Erdtman as having expressed the view that the palynological evidence is consistent with the interpretation of *Nouhuysia* as a member of the Guttiferae.

In 1953, the year following the appearance of Van Steenis's paper, Professor I. W. Bailey and B. G. L. Swamy (1) published the results of a detailed morphological and anatomical investigation of *Idenburgia* and *Nouhuysia*. The main conclusions reached by these authors were that *Idenburgia* and *Nouhuysia* can be interpreted as one genus, that the genus has no close affinities with the Monimiaceae in which family it was previously included, and that Van Steenis had wrongly interpreted *Nouhuysia* as a member of the Guttiferae.

Returning now to *Sphenostemon*, it may be noted that Professor G. Erdtman in 1952 (2) drew attention to the uncertain taxonomic position of the genus. He pursued the matter further in 1954 (3) by indicating that the pollen of *Sphenostemon* resembles that of *Nouhuysia* and *Idenburgia*, and he suggested that the possibility of a taxonomic affinity between all three genera was worthy of further investigation. Professor Erdtman, in the course of correspondence in 1954, also drew my attention to this problem, and suggested that I should study the anatomy of the vegetative organs of *Sphenostemon* to see how far the anatomical evidence supported his suggestion. I accordingly studied the anatomy of *Sphenostemon* in 1954, and the results are now recorded in the present paper. It may at once be stated, however, that the anatomical structure of the leaf and stem of *Sphenostemon* have so many points in common with that of *Nouhuysia*, interpreting this genus in the broad sense adopted by van Steenis, that there can be no doubt that the 2 genera are closely related. Whether *Sphenostemon* and *Nouhuysia* are congeneric, as has since been claimed by van Steenis (6), whose opinion is shared by Erdtman, is a point that

cannot be decided solely from the anatomical evidence at my disposal. In reducing *Nouhuysia* to *Sphenostemon*, van Steenis acknowledges his indebtedness to Erdtman for having drawn his attention to the similarity of the pollen of the 2 genera. Van Steenis, at the same time, withdrew his earlier opinion that *Nouhuysia* should be included in the Guttiferae. This exclusion of the Guttiferae from the picture has come as a great relief to those who have investigated the anatomy of the plants concerned, for neither Bailey and Swamy (1), nor I, could find any evidence to show that *Sphenostemon* or *Nouhuysia* have any connection with the Guttiferae whatsoever. The nature of the "resin ducts" that were alleged to occur in *Nouhuysia* must remain a mystery.

In his paper on *Sphenostemon* (6), van Steenis drew attention to the fact that the anatomy of the vegetative organs still awaited investigation. This statement, no doubt made in ignorance of the fact that I had already investigated *Sphenostemon*, induced Professor Bailey to return to the subject, and it was subsequently discovered, in the course of correspondence between Professor Bailey and myself, that he and I were mutually interested in the genus. Having told Professor Bailey about my work, he at once agreed that it would be best for me to publish my results. In now doing so, I must emphasize that my investigation has not been a complete one even so far as the vegetative organs are concerned, and no attention has been devoted to floral structure. It is therefore to be hoped that Professor Bailey will elaborate and extend this work by publishing his own results and conclusions.

B. Material Examined.

Since no material of *Sphenostemon* suitable for anatomical investigation was available at Kew, small portions of stems and leaves from herbarium sheets were obtained through the courtesy of Professor Humbert and Dr. G. Taylor from the herbaria in Paris and at the British Museum (Natural History) respectively. Grateful acknowledgment is made for this generous assistance, without which the work could not have been undertaken. The material examined was as follows :—

1. *Sphenostemon balansae* Baill. Balansa 1330.
2. *Sphenostemon comptonii* E. G. Baker Compton 1693.
3. Material which, when received, was labelled, "*Sphenostemon pachycardum* R. Br. 1930. M. Franc". From its microscopical structure it is perfectly clear that this specimen is in fact a *Sphenostemon*, and it seems not improbable that it is *S. pachycladum* Baill. It is referred to as *S. pachycladum* in the description which follows.
- At the same time the following specimens of *Nouhuysia* and *Idenburgia* from the Kew herbarium were examined for comparison.
- 4-5. *Nouhuysia papuanum* Laut. P. J. Eyma 5177 and 2219.
6. *Idenburgia novo-guineensis* L. S. Gibbs. Gibbs 5654.
7. *Idenburgia elaeocarpoides* Gilg & Schlecter. L. J. Brass 12661.

(If Erdtman and van Steenis's opinion that all of these plants belong to one genus is accepted, specimens 4-7 in the above list should now be known as *Sphenostemon papuanum* (Laut.) van Steenis and Erdtman).

C. Anatomical Description.

1. *Idenburgia* and *Nouhuysia*.

As was only to be expected, the microscopical structure of *Idenburgia* and *Nouhuysia* is very uniform, and furthermore the structure, as observed in my slides, agrees so closely with Bailey and Swamy's description (1) that there is no point in repeating it here, as details can so easily be obtained from Bailey and Swamy's paper.

2. *Sphenostemon*.

(i) Leaf.

Hairs ; none seen. Stomata ; confined to the abaxial surface, usually about 24–28 μ long, densely crowded, with a distinctive appearance in surface view, each stoma consisting of 2 crescent-shaped guard cells with an inflated appearance. The entrance to each stoma is protected by a projecting rim of cuticle, which appears in transverse sections through the leaf as 2 beak-like extensions which partly overarch the entrance to the stoma from opposite sides. Between the cuticular rim and the narrow channel that separates the inner, inflated portions of each of the guard cells from one another there is a wide vestibule. A hypodermis of cells with rather thick walls is subjacent to the adaxial epidermis in all of the specimens. In the particular leaves of which sections were examined, the hypodermis in *S. balansae* consists of 2 layers of cells similar to those of the epidermis ; in *S. pachycladum* it is also 2-layered, but some of the cells appear to be more horizontally elongated in transverse sections of the leaf. In *S. comptonii* it is 3-layered with some of the cells horizontally elongated. Mesophyll clearly differentiated into palisade and spongy portions. Palisade tissue consisting of 3–4 layers in all of the material, the palisade cells being rather short and with contracted walls. Spongy mesophyll well developed, with abundant intercellular spaces, the cells appearing to be horizontally elongated in transverse sections. Certain cells of the palisade tissue, where they are either solitary or in small groups, are filled with gum-like contents. Vascular bundles of the small veins embedded in the mesophyll, each bundle being accompanied on the abaxial side, or partly or wholly surrounded, by thick-walled fibres.

Midrib in all 3 species, exhibiting, in transverse section, a triangular, cylindrical vascular strand, with an abaxial apex, the vascular cylinder being supported externally by an almost continuous cylinder of thick-walled fibres. Petiole, in transverse sections through the distal end, exhibiting a similar vascular structure to that of the midrib. Sclereids, either isolated or in small groups, noted in the ground tissue of the petiole of *S. balansae* and *S. pachycladum*. Vascular cylinder in the petiole of all 3 species surrounded by a slightly interrupted ring of fibres.

Crystals, in the form of large, solitary styloids, occur in the mesophyll of all 3 species, especially in the palisade layers, the transversely fractured surfaces of many of these crystals appearing to be rectangular, and often square in transverse sections of the leaf. Similar, but smaller, crystals also occur in other parts of the leaf, e.g. in the ground tissue of the midrib, and numerous, but still smaller, cubical crystals in the phloem. Similar crystals present in all 3 species, but varying slightly in frequency in different leaves.

(ii) Stem.

No sections of the stem of *S. balansae* were available, and the following description therefore refers only to *S. comptonii* and *S. pachycladum*.

(a) *S. comptonii*. Stem 4 mm. in diameter.

Cork not well preserved ; consisting of thin-walled, outwardly convex cells, but having contents that are probably tanniniferous. Cortex about 10 cells wide ; many of the cells containing mucilaginous, and others tanniniferous, substances. Some sclereids, solitary and in small groups, also present. Phloem bounded externally by a composite, continuous ring, consisting of a mixture of fibres and sclereids. Xylem in the form of a continuous cylinder, traversed only by narrow rays. Vessels 12–60 (a high proportion about 40) μ in radial diameter ; mostly with a somewhat angular outline in transverse sections ; often in radial multiples, but others in tangential or oblique pairs, or, more rarely, solitary. Vessels with horizontally elongated to opposite bordered pits, or with scalariform pitting, in the lateral walls. Perforation plates very oblique, sometimes scalariform with numerous bars. Protoxylem vessels with spiral thickening. Ground tissue of the xylem consisting of radial rows of fibres, each fibre tending to be rectangular in transverse section and to have a lumen which is wide in relation to the thickness of the fibre wall. Fibres usually, but not invariably, greater in tangential than radial diameter, with bordered pits having slit-shaped apertures, that are often crossed. Rays mostly uniseriate, but some partly biseriate ; markedly heterogeneous ; most cells with contents that appear to be tanniniferous. Parenchyma scanty, a few paratracheal and diffuse cells being present. Parenchyma cells not easily distinguishable from the fibres in transverse sections, cells of both types being of about the same diameter, but parenchyma cells sometimes recognisable by their amorphous contents. Pith consisting of axially elongated cells, circular in transverse section, with moderately thick walls perforated by simple pits. Small intercellular spaces occur wherever walls of 3 adjacent pith cells meet together at one point. Some of the pith cells completely filled with tanniniferous material. Crystals occasional in the wood parenchyma, and small cubical crystals occur in the phloem.

(b) *S. pachycladum*.

A stem slightly less mature than the one of *S. comptonii* described above was very similar in structure. Cortex containing fairly numerous, thick-walled, pitted sclereids, that are mostly solitary and sometimes in small clusters. Xylem similar to that of *S. comptonii*, with vessels 16–44 (mostly 36–40) μ in radial diameter.

D. Comparison of *Sphenostemon* with *Nouhuysia* and *Idenburgia*.

So far as my own observations on *Nouhuysia* and *Idenburgia* have gone, they fully confirm the facts recorded by Bailey and Swamy (1). In comparing *Sphenostemon* with *Nouhuysia* and *Idenburgia* it is at once apparent that the differences are of very minor importance, and the resemblances quite outstanding. The most noteworthy character is the occurrence of similar styloids in all of the material examined, the styloids being accompanied by cubical crystals, and especially by small cubical crystals in the

phloem. When it is remembered that styloids are rare in the Dicotyledons as a whole, their occurrence throughout the material examined is all the more significant. Other resemblances in the stem structure are the cork of thin-walled cells, with outwardly convex walls ; the similar vessel patterns ; the horizontally elongated to opposite pitting of the lateral walls of the vessels ; the oblique perforation plates with numerous bars ; the similar rays ; the wood fibres with bordered pits (fibre tracheids). In the leaf the similarity of *Sphenostemon* to *Nouhuysia* and *Idenburgia* is shown by the general resemblance in the structure of the mesophyll ; the occurrence of cells with contents having a gum-like appearance ; the small veins embedded in the mesophyll and supported by fibres ; the similarity of the stomata. In addition it may be noted that the tissues in general contain tanniniferous substances. Points of difference between *Sphenostemon* on the one hand and *Nouhuysia* and *Idenburgia* on the other, are the presence of an adaxial hypodermis in *Sphenostemon* and not in the other 2 genera ; the trough-shaped structure of the main vascular strands throughout most of the length of the petiole and midrib of *Nouhuysia* and *Idenburgia* as opposed to the cylindrical strand with a triangular cross section in *Sphenostemon*.

E. Conclusions.

This investigation fully confirms that *Sphenostemon* is closely related to *Nouhuysia* and *Idenburgia*, but the anatomical evidence alone is insufficient to determine whether or not the group is unigeneric. It is also clearly evident that none of the genera is closely related either to the Monimiaceae, Aquifoliaceae or Guttiferae. On the other hand the anatomical evidence does not clearly indicate the affinities of the genera that have been investigated. It may be noted, however, that styloids of a similar nature to those in *Sphenostemon* and its allies occur also in the Escalloniaceae. The xylem of *Sphenostemon* also recalls that of some of the Escalloniaceae, particularly in the size and pattern of the vessels as well as in the pitting and perforation plates. The wood structure of the Escalloniaceae is, however, rather more specialized. These resemblances may, however, be no more than parallel developments of no taxonomic importance, and the matter clearly needs further investigation before reliable conclusions can be drawn.

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AFRICAN POLYGONACEAE.

A clarification in nomenclature and records.—*R. usambarensis*.

R. A. GRAHAM

Rumex usambarensis (*Engler ex Dammer*) *Dammer* in *Engl., Bot. Jahrb.* 38 : 61 (1905). Type : Tanganyika, *Holst* 2429 (K, lecto. !).

R. nervosus var. *usambarensis* *Engl., Glied. Veg. Usambara* 61 (1894), *nomen nudum* ; *Dammer* in *Engl. Pflw. Ost-Afr. C* : 169 (1895) *cum descr. brev.* Type as for species.

R. trinervius *Rech. f., Oesterr. Botan. Zeitschr.* 99 : 523 (1952). Type : Tanganyika, *Michelmores* 711 (K, holo. !).

R. maderensis of *Fl. Trop. Afr.* 6, 1 : 115 (1909) ; non *Lowe, Nov. Fl. Mad.* 12 (1838).

Up till publication of *Rechinger's R. trinervius*, the African species which the name designates was erroneously known as *R. maderensis*—an endemic of Madeira and the Canary Islands. *Rechinger's* species therefore corrected a long-standing error, but it appears that his name must be replaced by the earlier *R. usambarensis*.

The epithet of our species was first published by *Engler* as a variety of *R. nervosus* (a closely-allied but different African species), but without any description or specimens cited. *Dammer* provided a very short description in the *Pflanzenwelt*, and although this is—as *Rechinger* points out—incomplete, it is nevertheless adequate to validate the name. Later, *Dammer* raised the variety to specific grade. Thus *R. usambarensis* must stand in preference to *R. trinervius*.

The treatment of these species by *Peter* [*Fedde, Rep. Beih.* 40, 2 : 198-9 (1932)], creates a confusion, whose disentanglement can only be guessed at. He quotes *R. maderensis* and *R. nervosus* var. *usambarensis* (= *R. usambarensis*) as different taxa, with different specimens cited, and a clear diagnostic difference in the key. With regard to his *R. maderensis*, the name can be accepted as correctly applicable only to “Madeira” and “Canarien” and all his African records of it must be accepted as *R. usambarensis*—this being merely a change of name following *Rechinger's* creation of *R. trinervius*. But what then is *R. nervosus* var. *usambarensis* (= *R. usambarensis*) if it is different, according to *Peter*, from his records under *R. maderensis* ? In the key the latter is described (as would be correct for *R. usambarensis*) as having leaves “spieß- oder pfeilförmig” ; while *R. nervosus* var. *usambarensis* has leaves “nicht spieß- oder pfeilförmig”. At first sight it is difficult to know what this species of *Rumex* with leaves “nicht spieß- oder pfeilförmig” is ; as it occurs—according to *Peter's* examples cited—so widely in Tropical East Africa where, it must be remembered, typical *R. nervosus* does not occur. Fortunately some of the cited examples are still available for examination. [*Braun* 1367, *Volkens* 2104, *Conrads* 201 (Kew) ; *Engler* 1178 (Berlin) ; *Braun* 2792, *Uhlig* 409 & 741 (East African herbarium)], and all these are normal *R. usambarensis* with leaves distinctly “pfeilförmig” !. It is therefore strongly suggestive, and I think it must be accepted, that all *Peter's* records under *R. nervosus* var. *usambarensis* are the same species as all his records under *R. maderensis*. Apart from the exactitudes of taxonomy, there is really no other species that they could be—a negative argument of considerable weight in this case.

NOTES ON ASIATIC GRASSES : XXVI.

New Species

N. L. BOR

Agrostis stewartii Bor, sp. nov. ab aliis speciebus hujus generis glumis muricatis, spiculis cum pedicellis solutis, ramulis, ramisque demum solutis, valde distincta.

Gramen perenne erectum vel decumbens, nodis inferioribus radican-
tibus. Culmi usque 65 a.m. alti, laeves, glabri, teretes, valde striati, sim-
plices, nodis glabri. Foliorum laminae lineari-acuminatae, tenues, flacci-
dae, basin versus rotundatae, marginibus scabrae, utrinque scabrae, apice
praecipue scaberrimae; vaginae quam internodia longiores, laxae,
glabrae, valde striatae, inferiores a culmis solutae in fibrillos mutantes,
marginibus hyalinae, inferiores laeves, superiores scabrae; ligula
membranacea, 4-6 mm. longa, extra scaberrima.

Panicula usque 18 cm. longa, 5 cm. lata; axis inferne glaber laevisque,
apicem versus scaber; rami ad quemvis axis nodum dense verticillati;
ramuli ad quemvis nodum ramorum dense verticillati, ramuli minores ad
quemvis ramulorum nodum verticillati; rami, ramuli, ramuli minores
pedicellique a nodis demum soluti; spicula cum pedicello decidens;
pedicelli circa 3 mm. longi, graciles, scaberrimi. Glumae similes, inferior
3.5 mm. longa, superior paulo brevior, explanatae elliptico-acutae,
naviculares, dorso scaberrimae vel muriculatae. Lemma oblongo-
ellipticum, hyalinum, 3 mm. longum, 5-nerve, glabrum, laeve; nervi
quinque in 5 apiculos attenuati; palea hyalina, 1-1.25 mm. longa,
oblonga, apici lacerata; stamina 3; antherae 1-1.5 mm. longae, flavae;
lodicae 2, 0.5 mm. longae, elliptico-acutae.

IND. OR.: Nuri, Kagan, 4 Aug. 1899, *Inayat* s.n.; Swat State, Kalam,
2500 m., 23 Aug. 1952 R. R. Stewart 24733 (Typus in Herb.
Kew.).

The most remarkable thing about this species is the way the panicle
behaves after the spikelets are mature. In the great majority of species
of *Agrostis* the caryopsis falls with the lemma and palea if the latter
should be present, i.e., the rachilla disarticulates above the glumes.
In *Agrostis semiverticillata* the spikelets fall entire with the very short
pedicel, and in this respect the species resembles *Polypogon* and indeed has
been transferred to *Polypogon* by Hulten* for this very reason.

In *Agrostis stewartii* the point of disarticulation is similarly at the base
of the pedicel. This disarticulation is carried further, for at each node
of the axis and ramifications there is an abscission layer so that the whole
panicle breaks up and eventually falls away leaving the peduncle.
This is the only instance of such known to the writer and possibly warrants
a special section of the genus *Agrostis* to accommodate it.

Cyrtococcum decanense Bor, sp. nov. *C. patenti* (Linn.) A. Camus
simile sed ab eo spiculis majoribus recedit.

Gramen annuum culmis repentibus nodis radican-
tibus. Culmi decum-
bentes, demum erecti, ramosi, teretes, striati, glabri, laeves. Foliorum

*In Uppsala Univ. Årsskr. no. 7, 74 (1945).

laminae lanceolatae vel anguste elliptico-lanceolatae, ad basin angustatae, in apicem acuminatum attenuatae, utrinque pilis e tuberculis ortis sparse pilosae, supra laeves, infra scabrae, marginibus scaberrimae; *vaginae* striatae, laeves, glabrae vel sparse pilosae, marginibus ciliatae; *ligula* membranacea, 1 mm. lata.

Panicula 10–15 cm. longa; axis angulatus, angulis scaber; *rami* ramulique similes; pedicelli quam spiculas longiores. *Spiculae* 1·8–2·5 mm. longae, valide compressae. *Gluma inferior* 1–1·5 mm. longa, explanata late elliptico-acuta, valide compressa, dorso recta, 3-nervis, translucens, glabra vel sparse intra nervos laterales et marginem pilosa; *gluma superior* navicularis, dorso valde curvata, compressa, 1·5–2 mm. longa, 5-nervis sed eorum nervi laterales inconspicui, brunnea, glabra vel tomento brunneo oblecta. *Anthoecium inferius* vacuum; *lemma* glumae superiori simile apicem versus tomentosum vel glabrum; *palea* nulla. *Anthoecium superius* ♂; *lemma* a latere oblique semilunare visum, 2 mm. longum, valde compressum, haud carinatum, chartaceum vel coriaceum; *palea* dorso rotundata nec carinata; *stamina* 3; *antherae* c. 1 mm. longae; *styli* 2; *stigmata* plumosa.

IND. OR.: Madras State; Goodaloor Ghat, 1500 m., 1 Nov. 1889, *M. A. Lawton*; Lower Pulneys, Tandigudi, 23 May, 1899, *Bourne* 2996; Nilgiris, Hulikal drug forest, May, 1889, *J. S. Gamble* 20695; Nilgiris, Old forest, 1800 m., Oct. 1889, *J. S. Gamble* 21384; Gudalur Ghat, Dec. 1899, *Bourne*; ibidem Kartery Waterfalls, May 1900, *Bourne*; Pulneys, Periya Shola, 23 Jun. 1901, *Bourne*; High Wavy Mountain, May, 1917, *Blatter et Hallberg* 689.

Ceylon: *Thwaites* C.P. 886; Hakgala, 19 Feb. 1927, *A. H. G. Alston* 1045—in dense shade; Hakgala, gully near Bot. Garden, 1800 m., 30 Dec. 1950, *F. Ballard* 1341—in damp jungle (Typus in Herb. Kew.).

This species has much larger spikelets than *C. patens* (Linn.) A. Camus and is confined to altitudes in the neighbourhood of 1500–2000 m., and has been much confused with this species in the past. A search has not revealed that any name has been given to this grass and it is now named *C. deccanense*. The type selected is F. Ballard's specimen which shows the straggling habit of this species very well.

Eulalia smitinandiana Bor, sp. nov. ab omnibus speciebus adhuc descriptis spiculae sessilis gluma inferiore longe biaristata valde distincta.

Gramen perenne. *Culmi* erecti, graciles, usque 1 m. alti, teretes, laeves, glabri, simplices. *Foliorum laminae* lineari-acuminatae, usque 30 cm. longae, 4–5 mm. latae, valde multi-nervati, infra laeves glabraeque, supra marginibusque scaberulae, convolutae, tortae vel complicatae, in apicem filiformem attenuatae, virides, purpurascens; *vaginae* culmos complectentes, laevissimae, glabrae, striatae, purpureae; *ligula* membranacea, angusta, ciliata.

Racemi 2–3, subfasciculati, 8 cm. longi. *Spiculae* ad quemvis rhacheos nodum binae, pedicellata a pedicello demum soluta, sessilis et cum rhacheos articulo accumbente demum decidens, similes, oblongo-

ellipticae, 5 mm. sine aristas longae ; articuli rhacheos 4 mm. longi, pilis albis longe ciliati, apici oblique articulati ; pedicelli circa 3.5 mm. longi, articulis similes. *Spicula sessilis* ; *gluma inferior* dorso leviter depressa, 5 mm. longa, bifida, 6-nervis, marginibus inferne rotundata, superne carinata, carinis scabra, apicem versus ciliata ; *glumae lobi* aristati ; *aristae* 4-5 mm. longae ; *gluma superior* 5 mm. longa, navicularis, 3-nervis, dorso inferne rotundata, superne apicem versus carinata, apici bifida, aristata (arista 9 mm. longa), inferne lateribus breviter barbata. *Anthoecium inferius* vacuum ; *lemma* hyalinum, 3.5 mm. longum, ciliatum ; *palea* abest. *Anthoecium superius* ♂ ; *lemma* 4.5 mm. longum ad $\frac{1}{2}$ in lobos acutos angustos fissum, ex fissura aristam perfectam columna castanea exserens ; *palea* oblonga, obtusa, hyalina, 2 mm. longa ; *stamina* 3 ; *antherae* rubrae, 2.5 mm. longae ; *styli* 2 ; *stigmata* plumosa, nigro-purpurascens ; *lodicae* 2, cuneatae, carnosae ; *arista* 20-25 mm. longa ; *columna* torta 12-15 mm. longa ; *spicula* pedicellata sessili similis.

THAILAND : Loei, Phu Krading, c. 1300 m., 29 Oct. 1954, *Tem Smitinand* 2053. "Tufted grass, common rocky ground in open pine forest ; glumes dark purple ; anthers dark brown ; stigmas dark purple." (Typus in Herb. Kew.).

A very distinct species distinguished by the lower glume of the sessile spikelet being bilobate, the two lobes bearing long bristles.

Panicum fischeri Bor, sp. nov. *P. gardneri* Thw. et *P. inciso* Munro affinis sed ab eo foliis linearibus et ab hoc ligulis fimbriatis haud membranceis inter alia differt sed a speciebus omnibus rhachilla producta membranacea recedit.

Gramen probabiliter perenne. *Culmi* ut videtur alti, teretes, laeves, glabri. *Foliorum laminae* superiores lineares, ad basin contractae, in apicem longum attenuatae, usque 30 cm. longae, 8 mm. latae, ad basin pilis brevibus e tuberculis ortis ornatae, laeves ; inferiores probabiliter multo longiores latioresque sed non visae ; foliorum *vaginae* culmos complectentes, laeves, sulcatae, glabrae ; *ligulae* ad seriem pilorum longiusculorum redactae.

Panicula usque 30 cm. longa, 25 cm. lata, pauci spiculata ; rami inferiores subverticillati usque 15 cm. longi ; axis, rami, ramuli, pedicellique scaberuli. *Spiculae* 5 mm. longae. *Gluma inferior* 2.5-3 mm. longa, explanata 1.5 mm. lata, ovata, acuta, glabra, laevis, 5 nervis anastomosantibus ; *gluma superior* 5 mm. longa, explanata 2.5 mm. late elliptica, apici valde compressa, glabra, laevis, 9-nervis. *Anthoecium inferius* vacuum ; *lemma* *glumae inferiori* persimile, aequilongum, ellipticum, acutum, apici compressum, glabrum, laeve, 9-nerve ; *palea* hyalina, oblongo-elliptica, acuta, bicarinata. *Anthoecium superius* ♂ ; *lemma* 3.5 mm. longum, coriaceum, ellipticum, obtusum laevissimum, glabrum, nitens, flavum ; *palea* coriacea, marginibus rotundata ; *stamina* 3 ; *antherae* 2.5 mm. longae ; *styli* duo ; *stigmata* plumosa ; *rhachilla* producta, membranacea, lata, apiculata, lemmati aequilonga.

IND. OR. : Madras State ; Nilgiris, Kullar, 450 m., Aug. 1886, *J. S. Gamble* 17814 ; ibidem, Oct. 1889, 750 m., *J. S. Gamble* 21388 (Typus in Herb. Kew.).

The most remarkable feature of this species is the rhachilla which is produced beyond the insertion of the upper floret. The rhachilla is strap-shaped, membranous and ends in a small point. It was present in each of ten spikelets, five taken from each plant.

This species was collected as stated above on two occasions in the same place, Kullar in the Nilgiris, but apparently nowhere else. It is a good species and should be sought for again in the same locality.

I have named this fine grass in memory of the late *C. E. C. Fischer* whose work on the flora of Madras will be long remembered.

A new form of *POLYGONUM SENEGALENSE* Meisn.

Examination of an adequate number of specimens of the Tropical African *P. senegalense* Meisn., and of *P. lanigerum* var. *africanum* Meisn., which has a similar distribution, leads to the conclusion that both are merely forms of the same species. The only difference is in hairiness, *P. senegalense* being outwardly a green and glabrous plant while *P. lanigerum* var. *africanum* has a white or grey tomentum on the leaves and stems, and this, when thick, renders the plant noticeably hoary. The two forms should be regarded as extremes, between which intermediates will be found—either as in those (such as *Dümmer* 3265 !) where the degree of hairiness is approximately mid-way between the two ; or (as in *Drummond & Hemsley* 2012 !) where the leaves are hoary below but green and only thinly pubescent above ; or (as in *Drummond & Hemsley* 2082 ! sheets 2 and 3) where some leaves are hoary on both sides while others (apparently the more mature) are essentially glabrous.

While no important taxonomic significance is claimed for the hoary form, it is thought advisable to retain it in low grade rather than sink it altogether as it is a well-known and rather attractive plant which has been previously treated variously as a species and as a variety.

***P. senegalense* Meisn., Prodr. 54 (1826).**

forma **albotomentosum** *R. Grah. f. nov.* a *P. senegalense* typico foliis caulibusque valde albotomentosis vel cinerascensibus distinguitur.

Holotypus : Tanganyika, Ufipa District, Lake Kwela, 19 March 1950, *A. A. Bullock* 2666 ! (K).

Syn. *P. lanigerum* var. *africanum* Meisn. in DC. Prodr. 14 : 117 (1856).

P. lanigerum of Fl. Trop. Afr. 6, 1 : 109 (1909), and of Fl. Cap. 5, 1 : 468 (1912), non R. Br.

R. A. GRAHAM.

QUELQUES CLADONIA (LICHENS) DES RÉGIONS INTER-TROPICALES, NOUVEAUX OU PEU CONNUS, CONSERVÉS DANS L'HERBIER DE KEW.

par HENRY DES ABBAYES

Nous remercions bien vivement Sir Salisbury, Directeur des Royal Botanic Gardens de Kew, de nous avoir confié pour étude une collection de *Cladonia* exotiques, provenant de diverses récoltes restées encore indéterminées. Nous ne retiendrons ici que ceux qui présentent un intérêt systématique ou dont le lieu de récolte ajoute à nos connaissances de leur répartition géographique.

***Cladonia miniata* Mey. var. *anaemica* (Nyl.) Wain., Zahlbr. Catal. n° 8847.**

BRITISH GUIANA : environs de Dapacoma, sur terre sableuse (A. W. Bartlett, 9-1904, n° 7951).

Espèce connue de diverses régions d'Amérique du Sud mais non encore, à notre connaissance, de l'une ou l'autre des Guyanes.

***Cladonia vulcanica* Zoll. (= *Cl. didyma* Wain. var. *vulcanica* Wain., Zahlbr. Catal. n° 8792).**

Bien que Wainio (1887) ait réuni le *Cl. vulcanica* de Zollinger, comme simple variété, à *Cl. didyma* (Fée) Wain., nous estimons cependant qu'il y a intérêt, à cause de son chimisme, (KOH+ jaune, P+ orangé-rouge) à le considérer comme une espèce distincte, ainsi que l'ont déjà fait divers auteurs (Robbins and Blake, 1931 ; Evans, 1940, 1952 ; des Abb., 1947 ; Asahina, 1950). Nous avons donc considéré comme appartenant à la forme typique les échantillons correspondant à la définition de Zollinger et conformes aux spécimens authentiques de cet auteur. Mais de plus, l'espèce présentant des variations morphologiques importantes, qui avaient été sousestimées par Wainio, nous pensons qu'il est nécessaire, pour des raisons de clarté, de reprendre, à titre de formes subordonnées à *Cl. vulcanica*, *Cl. isidioclada* Mont. et v.d.B. et *Cl. melanodes* Nyl., que Wainio avait considérés comme étant de simples synonymes de sa var. *vulcanica*. Il est à remarquer aussi que, dans son ensemble, la description de Wainio se rapporte davantage aux échantillons décrits comme *Cl. isidioclada* par Montagne et van den Bosch qu'au type de Zollinger. Elle passe même sous silence un caractère, cependant nettement exprimé par ce dernier auteur, la présence possible de petits scyphes, ce qui a pu gêner considérablement par la suite la détermination correcte des échantillons présentant ce caractère.

Se rapportent à la forme typique les échantillons suivants :

SIAM : Kao Krading, Lôi, alt. 1200 m, sur rochers calcaires (M. C. Lakshnakara, 3-4-1933, n° 1393) : même lieu, en station découverte (A. F. G. Kerr, 1924, n° 424).

Les caractères sont ceux consignés dans la description de Zollinger ou constatés sur un échantillon authentique conservé dans l'herbier du Muséum de Paris (Planta Javanica a cl. Zollingero lecta n° 871), notamment : présence de folioles parfois nombreuses sur les podétions partielle-

ment aréolés-cortiqués, ou décortiqués et montrant une couche chondroïde souvent sombre, les fertiles couronnés par une ou plusieurs apothécies, les stériles subulés ou munies de petits scyphes dentés sur les bords. On n'observe pas, dans cette forme typique, le cortex se résolvant en granulations et petites squames isidioides qui caractérisent la f. *isidioclada*.

D'après Asahina (1950) *Cl. vulcanica* contient de l'acide barbatique, de l'acide didymique et de l'acide thamnolique. Nous avons pu les caractériser microchimiquement dans les échantillons cités ici (sauf l'acide barbatique dont la présence est cependant probable, mais qui ne nous a pas donné de cristaux bien nets). De plus le n° 424 de Kerr, qui présente une légère teinte jaunâtre, nous a montré l'existence, en petite quantité, de l'acide usinique, substance manquant par contre dans l'échantillon n° 1393 de Lakshnakara, qui est du reste d'aspect plus grisâtre. Il faut donc ajouter aux substances chimiques de *Cl. vulcanica*, à titre de constituant accessoire, l'acide usinique, ce qui n'avait pas encore été observé.

f. *melanodes* (Nyl.) des Abb., comb. nova.

NOUVELLE GUINÉE HOLLANDAISE : mont Carstensz, alt. non notée, (C. Boden Kloss, Utakwa Expedition, 6-1913, sans n°).

Le type de *Cl. melanodes* Nyl. provient de l'île Harbour (Amérique Australe) et est ainsi décrit (*apud* Crombie, 1877, cité d'après Wainio, 1887) : "*Podetia nigra cornuta recta* (alt. *circiter bipollicaris vel circiter 4 centimetrorum, crassit. 1-2 millimetrorum*), *granulis albidis minutulis vel subpulvereis* (*K + flavescens*), *inspersa, basi squamulis parvis subcrenatis ; apothecia non visa*." Grâce à l'obligeance de Sir Salisbury nous avons eu en communication le type de Nylander, conservé à Kew dans l'herbier Hooker. Les présents échantillons de Nouvelle Guinée lui sont rapportables sans hésitation : ils sont cependant encore plus grêles, ont leur cortex plus rare et leurs folioles plus régulièrement réparties sur toute la longueur des podétions ; les conidanges sont assez fréquents et semblables à ceux observés sur les podétions stériles du type. On doit donc interpréter la f. *melanodes* comme un état subulé, grêle, peu ou pas ramifié du type, très décortiqué et muni comme lui de petites folioles. L'aspect noir de la couche chondroïde dénudée n'autorise pas à en faire un "*status morbosus*", ainsi que le pensait Wainio, car ce caractère semble être l'état le plus fréquent chez les représentants du type et les présents échantillons, comprenant plusieurs dizaines de podétions, dont certains portent des conidanges, ne paraissent nullement malades.

f. *isidioclada* (Mont. et v.d.B.) des Abb., comb. nova.

PERU : Huánuco, alt. 2700 m, sur bois pourrissant, à demi-ombre (Christopher Sandeman, 10-1945, n° 5121).

COLOMBIA : Rio Negro, alt. 2250 m, sur bois pourrissant, à l'ombre (Christopher Sandeman, 1-1948, n° 5646).

BRITISH GUIANA : Amakura River, NW district, sur bois pourrissant J. S. De La Cruz, 23-3-1923, n° 3527).

WEST INDIES : Ile Tortola, mont Sage, alt. 530 m (W. Fishlock, sans date et sans n°).

Cette forme est caractérisée, ainsi que le dit la description de Montagne (1856) : "... *podetiis cylindricis simplicibus aut furcatim ramosis validis, epiderme in squamulas confertim imbricatas patenti-recurvas dissectas isidiomorphas secedente asperis ; scyphis obsoletis ; apotheciis fusco-coccineis, apice in capitulum conglomeratis* ..." Nous en avons vu un petit échantillon authentique dans l'herbier du muséum de Paris (Java, coll. Junghuhn). Le nom même donné par Montagne semble insister sur le caractère isidioïde des squamules des podétions. C'est surtout de tels échantillons que Wainio devait avoir en vue lorsqu'il a établi la description de son *Cl. didyma* var. *vulcanica*, car c'est la forme la plus répandue dans les collections, principalement à l'état fertile. Il est remarquable de plus de constater que la plupart des échantillons sont de couleur claire, avec une couche chondroïde rarement un peu brunie et souvent semi-pellucide. Là encore on peut observer parfois de petits scyphus.

Bien qu'à l'aspect des deux formes soit le plus souvent bien différent du type, il existe cependant des exemplaires de passage indiquant qu'il n'y a pas de différence à une seule espèce.

Cladonia corallifera (Kunze) Nyl. var. **Kunzeana** Wain., Zahlbr. Catal. n° 8776.

BRITISH GUIANA : "Cattle trail Survey" (Abraham, 1919, n° 136 A), 12 échantillons.—Muri, Waranama Ranch, sur sol sableux (Martyn, 9-1929, n° 148).

Sur les douze échantillons que comporte le n° 136 A d'Abraham, et qui sont cependant très homogènes morphologiquement, quatre marquent KOH— et P—, sept KOH— et P+ légèrement jaune ou orangé, un KOH+ jaune et P+ orangé-rouge. L'échantillon n° 148 de Martyn marque KOH+ jaune, P+ orangé-rouge.

Wainio (1887) attribue à *Cl. corallifera* et à ses variétés la réaction KOH—. Cependant, si on examine les échantillons de l'herbier du Muséum de Paris, cités par Wainio comme appartenant à *Cl. corallifera* var. *Kunzeana*, on s'aperçoit qu'ils se comportent comme ceux cités plus haut (Surinam, leg. M. Hortmann, 1843, n° 819, KOH—, P+ légèrement jaune ; Brésil, Spruce Lich. Amaz. et And., n° 30, KOH—, P+ jaune ; et n° 31, KOH+ jaune, P+ orangé). La réaction positive avec P semble démontrer, dans certains échantillons, la présence d'acide thamnolique, mais en quantité parfois si faible que la réaction positive avec la potasse (qui doit normalement accompagner celle de la paraphénylènediamine dans le cas de l'acide thamnolique) n'est souvent pas perceptible, ce qui explique qu'elle ait échappé à Wainio, qui n'avait pas à son époque le précieux contrôle de la paraphénylènediamine. Cependant il est des échantillons chez qui il n'existe aucune réaction perceptible. C'est le cas notamment du type même du *Cl. corallifera* (Surinam, leg. Weigelt, 1827) analysé par Asahina (1939) et chez lequel il n'a trouvé comme constituants que l'acide usnique et la bellidiflorine. Dans ces conditions l'acide thamnolique ne serait qu'un constituant accessoire de *Cl. corallifera* var. *Kunzeana*.

L'espèce, telle que l'avait comprise Wainio, n'est pas homogène. La var. *transcendens* Wain. a, par la suite, été élevée au rang d'espèce par Wainio lui-même et sa valeur a été précisée par Evans (1951), qui y a

trouvé de l'acide usninique et de l'acide thamnolique. La var. *gracilescens* Wain., d'après les types cités du Brésil et vus par nous dans l'herbier du Muséum de Paris (Spruce, Lich. Amaz. et And., n° 32 et 33) bien différente d'aspect de la var. *Kunzeana* et marque KOH— et P— : ille devra un jour, en être séparée comme espèce distincte. Quant à la var. *Kunzeana*, puisqu'elle s'identifie avec le type du *Cenomyce corallifera* Kunze, elle restera le seul représentant de l'espèce et son nom deviendra alors inutile.

Cladonia capitellata (Tayl.) Babingt. f. **interhiascens** (Nyl.) Wain., Zahlbr. Catal. n° 8755.

BRITISH GUIANA : sommet du mont Roraima, alt. 2580 m (F. V. McConnell et J. J. Quelch, 1898, n° 509).

Nous avons comparé cet échantillon avec le type de *Cl. interhiascens* Nyl. (Ile Campbell, M. Filhol, 1874), conservé dans l'herbier du Muséum de Paris ; il lui est morphologiquement et chimiquement conforme : podétions dressés, jaunâtres, à cortex aréolé et aisselles dilatées béantes, KOH+ jaune net surtout aux extrémités, P+ orangé surtout aux extrémités.

Cette forme, jusqu'ici connue uniquement de l'Ile Campbell, est nouvelle pour l'Amérique du Sud, où la forme typique a déjà été récoltée au Brésil.

Cladonia siamea des Abb., sp. nova.

Thallus primarius non visus, verisimiliter squamulis sicut podetiorum constitutus. Podetia nunc dichotome aut trichotome inaequaliter ramosa, axem sympodiale usque ad 5 cm altum et 1,5 mm crassum efficientia, tum erecta confertaque ; nunc subaequaliter dichotome aut trichotome repetito ramosa, inde axem sympodiale distinctum non efficientia, tenuiora (circa 1 mm crassa), tum intricata et pulvillos efficientia ; apicibus bi-aut tri-cornutis, attenuatis, divaricatis nec nutantibus ; straminea, laevigata, opaca, esorediosa, basi nonnunquam foliolis irregulariter crenatis praedita ; axillis plerumque integris, raro perforatis. Stratum corticale verum non evolutum, tenue, ex hyphis conglutinatis sed tamen conspicuis, sublongitudinaliter dispositis constitutum aut passim fere amorphum. Stratum medullare exterius hyphis conspicuis subdiscretis constitutum et lacunas crebras aere plenas continens, inde toto impellucidum, in stratum chondroideum tenue atypicum, ex hyphis tantum parte conglutinatis constitutum et lacunas aere plenas continens, inde impellucidum, transiens. Podetia cum hydrate kalico lutescentia, addito hypochlorito sodico intensius colorata ; cum paraphenylenediamina aurantiaco-rubescencia ; acidum usninicum et acidum thamnolicum continentia. Apothecia non visa. Conidangia semiglobosa vel breviter cylindrica, haud basi constricta, in quibus color materiae productae non observatus.

Secundum habitum proprium et ramificationem, duae formae dignoscendae sunt :

f. **evoluta** des Abb. nova.—Podetia erecta, inaequaliter ramosa, axem sympodiale efficientia. Statum typicum, bene evolutum speciei constituit.

f. **pulvinata** des Abb. nova.—Podetia subaequaliter dense ramosa et in pulvillis intricata.

SIAM : Phu Krading, Loie (NE Thailand), alt. 1300 m, "Lichens very common on barren rocks in open Pine forest" (Royal Forest Depart.'s Collect., 4-1954, n° 10791), f. *evoluta* et f. *pulvinata*.—Kao Krading, Lôi, alt. 1200 m, sur rochers découverts (A. F. G. Kerr, 14-3-1924, n° 427), f. *pulvinata*.

Cette espèce appartient au groupe des *Unciales* et est voisine de *Cl. substellata* Wain. du Brésil, dont elle présente du reste les mêmes variations dans le port. Nous l'avons comparée avec des exemplaires authentiques de cette espèce conservés dans l'herbier du Muséum de Paris (Brésil, prov. de Rio de Janeiro, A. de St-Hilaire, 1816-1821, f. *subuncialis* Wain. et f. *divergens* Wain.). Elle s'en distingue cependant à la fois par ses réactions et par sa structure : *Cl. substellata* est insensible à KOH et à P ; sa médulle extérieure et sa couche chondroïde, bien que d'un type aberrant avec lacunes pleines d'air, sont formées d'hyphes soudées entre elles, si bien que, si sous une loupe binoculaire on décortique avec un scalpel un podétion de *Cl. substellata*, la médulle et la couche chondroïde apparaissent subpellucides avec seulement des stries opaques, alors que chez *Cl. Siamea* tout est opaque et d'aspect feutré jusqu'à la lacune centrale, dont la surface seulement apparaît un peu lisse.

On peut aussi la comparer avec différentes autres espèces à structure rudimentaire du groupe des *Unciales*, dont elle est cependant distincte : *Cl. pachycladodes* Wain. d'Amérique du N, dont le cortex épais est feutré, formé d'hyphes libres, la couche chondroïde mince et fragmentée en un réseau lâche, si bien que les parois et la cavité des podétions apparaissent feutrés, KOH— et P—. *Cladonia Perrieri* des Abb. de Madagascar, qui contient, comme *Cl. Siamea*, de l'acide thamnolique et présente les réactions KOH+ jaune et P+ orangé-rouge, mais dont le cortex épais est formé d'hyphes libres et dont la couche chondroïde est du même type que chez *Cl. substellata*. *Cl. subsetacea* Robb. d'Amérique du N, qui a un vrai cortex lisse et brillant, une couche chondroïde plus nette, est plus grêle et contient de l'acide baecomycétique, KOH—, P+ jaune. Notons aussi que si la f. *evoluta* rappelle un peu *Cl. uncialis* (L.) Web., elle en est cependant bien distincte par sa structure et, son chimisme.

Cladonia salzmanni Nyl., Zahlbr. Catal. n° 8880, f. **ascypha** des Abb. nova.

Podetia apicibus furcato-subulatis nec scyphoideo-hiantibus. De cetero similis typo ; KOH—vel minime lutescens in apicibus ; P—vel minime rubescens in apicibus.

BRITISH GUIANA : Amakura River, NW district (J. S. De La Cruz, 23-3-1923, n° 3547).

Comparé au type de l'espèce, conservé dans l'herbier du Muséum de Paris (Brésil, Bahia, leg. Blanchet, 1844) le présent échantillon se montre très semblable pour l'aspect de surface, la couleur, la structure des podétions et les réactions. La seule différence réside dans les extrémités et les aisselles qui, dans le type, sont pour la plupart dilatées béantes, scyphifères et prolifères, alors que les extrémités sont subulées dans le présent exemplaire. Cependant sa détermination spécifique ne

nous paraît pas douteuse, car il présente quelques rares podétions dilatés en scyphes béants et prolifères comme dans le type. Cette absence presque complète de scyphes lui confère un habitus particulier qui nous semble justifier la distinction de la présente forme *ascypha*.

Cette espèce n'a encore été que très peu observée jusqu'ici et est connue uniquement du Brésil. Elle est nouvelle pour les Guyanes.

Cladonia aff. **furcata** (Huds.) Schrad.

JAMAICA : near Cinchona, alt. 1840 m, on banks under shrubs (W. Harris, 11-4-1896, n° 10008).

Nous attirons l'attention sur ce *Cladonia* encore insuffisamment connu et sur lequel nous hésitons à mettre un nom définitif.

Podétions jusqu'à 7 cm de haut et 2 mm d'épaisseur, rappelant beaucoup par leur port et leur ramification *Cl. furcata* var. *racemosa* Flk. f. *furcatosubulata* Hoffm., mais en plus robuste (dépourvus de folioles sur l'échantillon ci-dessus), blanc d'ivoire et lisses. Cortex mince continu ou subcontinu, formant parfois des aréoles non saillantes, laissant voir entre elles la couche chondroïde bien développée, compacte, claire et bien pellucide. KOH+ jaune, P+ jaune passant au rouge.

En 1938 nous avons eu à examiner de semblables échantillons de la même provenance, conservés dans l'herbier du British Museum. Après avoir pris l'avis du spécialiste des *Cladonia* le Dr. Sandstede, nous les avons nommés *Cl. furcata* var. *racemosa* f. *furcatosubulata*, tout en notant que, par leur réaction KOH+ jaune, ils faisaient transition à *Cl. subrangiformis* Sandst. (des Abb. in Journ. of Botany, dec. 1938, p. 350). Consulté à nouveau par la suite, Sandstede (*in litt.*), confirma l'espèce *Cl. furcata* mais rapporta les échantillons à la var. *pinnata* et à une forme *nudior* Sandst. Après avoir encore revu des doubles de ces échantillons et un autre de même provenance communiqué par Sandstede (*ex herb.* Evans), semblable aux autres notamment par sa couleur blanche et ses réactions, mais muni de folioles, nous arrivons à la conviction qu'il s'agit d'une espèce distincte de *Cl. furcata*.

La description de *Cenomyce tropica* Del. provenant de l'île St-Dominique des Antilles (*apud* Wainio, 1887, qui le réunit à *Cl. rangiformis* Hoffm. var. *muricata* Arn.) lui convient bien. Mais en l'absence du type, que nous n'avons pas pu retrouver dans l'herbier du Muséum de Paris, il nous est actuellement impossible d'affirmer qu'il s'agit bien de cette espèce et conséquemment de la rétablir comme telle. D'autre part, dans ce doute, nous ne nous croyons pas autorisé à décrire une nouvelle espèce. Nous réservons donc pour l'avenir la solution du problème.

Cladonia **erythrosperma** Wain. var. **Thomsoni** Wain., Zahlbr. Catal. n° 8799.

ILE DE HAINAN (Chine) : Five Finger Mt. (F. A. McClure, 1-5-1922, n° 9389).

Grâce à l'amabilité du Prof. A. Vaarama de l'Université de Turku (Finlande), nous avons eu en communication deux échantillons authentiques du type de l'espèce, récoltés par Wainio (Brasilia Carassa in prov. Minarum, 1885, n° 15086). Le présent échantillon leur est semblable

pour l'essentiel, notamment le type de ramification et l'aspect du cortex des podétions, ainsi que pour les réactions (KOH + jaune intense, P + jaune — orangé-rouge). Il en diffère par la taille plus élevée, environ 6 cm et l'absence complète de folioles sur les podétions. Par la taille, il se rapporte à la var. *Thomsoni* Wain. Mais, celle-ci étant pourvue de folioles et le présent échantillon en étant complètement dépourvu, il en constitue une forme qu'on peut nommer :

f. **nuda** des Abb. nova.—Similis var. *Thomsoni*, sed podetia squamis destituta.

Le type n'est encore connu que d'Amérique du Sud ; la var. *Thomsoni* seulement des Indes Orientales. L'espèce représentée par sa variété est nouvelle pour les territoires d'Extrême-Orient.

Cladonia formosana Asahina, Journ. Japan. Bot., XVII, p. 485-489, 1941 (= *Cl. decipiens* des Abb., Bull. Mus. Paris, 2me série, XIX, p. 115, 1947), f. *sublaevigata* Asahina.

PAPOUASIE (NOUVELLE GUINÉE ANGLAISE) : Kortoki, alt. 480 m, à terre (C. E. Carr, 23-6-1935, n° 12667).—Morobe District, alt. 2000 m, parmi les Mousses sur rochers assez escarpés (R.D. Hoogland, 25-3-1953, n° 3181).

Cette espèce est voisine de *Cl. pityrea* (Flk.) Fr. dont elle se distingue, entre autres, par ses réactions KOH-, P+ jaune intense (acide psoromique). Le type est partiellement décortiqué-sorédié ; la f. *sublaevigata* est presque entièrement cortiquée.

Espèce connue du Japon (Kiushiu, Shikoku, Hondo), Formose ; Iles Hawaï (Maui) (*sub nom. Cl. decipiens* des Abb.) et dernièrement du Mexique et du Guatemala (*apud* Evans, 1955). Nouvelle pour la Nouvelle Guinée qui constitue pour l'instant sa limite australe.

Cladonia strepsilis (Ach.) Wain., Zahlbr. Catal. n° 8892.

BRITISH GUIANA : Demerara River (Jenman, 1897, n° 7378).

Espèce cosmopolite de presque tout l'hémisphère N tempéré, bien reconnaissable à sa réaction KOH (ClONa) + vert. En Amérique elle n'était pas connue au S de la Jamaïque. Nouvelle l'Amérique du Sud.

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Amateur Gardening Books.*—Two “Amateur Gardening” Handbooks have just appeared which provide at a small outlay advice on topics where guidance is particularly helpful to the beginner. The first deals with the art of arranging flowers, which is perhaps more dependent upon natural aptitude than on acquired technique, but even those with an instinctive bent will find here hints from experience that the novice will find of real assistance whether in the use of foam plastic or wire netting as a means of assuring controlled positions or the evaluation of appropriate composition in symmetrical or asymmetrical arrangements. The subject of the second book is “Town Gardening” and treats of the problems that confront the City dweller, but the emphasis on each of these hardly seems appropriate to their relative importance with, for example, seventeen pages devoted to wall concealment and only five to soil improvement in a not very illuminating treatment.

E.J.S.

* Flower Arrangement by Violet Stevenson ; Town Gardening by P. R. S. Hunt ; both published by W. H. & L. Collingridge at 4s. each.

NOTES ON AFRICAN STRYCHNOS: V.¹

† E. A. BRUCE & JOHN LEWIS

The preparation of this article was begun by Miss E. A. Bruce as part of the revision of certain genera of *Loganiaceae* for the Flora of Tropical East Africa. The taxonomic arrangement given here is that which, as far as can be judged, she would have wished to present. Only a few minor alterations have been made to those parts of the manuscript that she left, and in making additions and composing the whole the second author has made full use of the excellent notes left by her. The passing of a taxonomist inevitably leads to the loss of much valuable specialist experience and it will not be possible, in a short time, to gain the understanding of the genus *Strychnos* which Miss Bruce had acquired. In so far as he can judge at present, however, the second author finds himself in agreement with her on the general nature of the taxonomic treatment to be desired for the genus; he had in fact discussed some of the problems of the group with her. It is both a pleasure and an honour to undertake the completion of the difficult task which she had so painstakingly commenced.—J.L.

Specimens cited in small type below have all been seen; the examination of type material is individually indicated. The authors are indebted to the authorities of the following herbaria for making their material of the genus available for study: British Museum (Nat. Hist.); East African Herbarium; Herbarium Horti Botanici Bruxellensis and National Herbarium, Pretoria.

***Strychnos* § *Densiflora* DuRoi.²**

This Section can be characterised by the following phrases:

Unarmed shrubs, small trees or climbers. Inflorescences axillary. Calyx-lobes suborbicular, ciliate. Corolla-tube cylindrical, pilose at the throat, longer than the thickened lobes. Anthers sessile in the throat of the corolla, just exerted, not bearded. Style usually pilose at the base, long, \pm exerted. Fruits usually large and several-seeded.

KEY TO THE SPECIES OCCURRING IN EASTERN TROPICAL AFRICA.

Leaves with a small sharp apical spine 1. ***S. pungens***

Leaves not spinous apically:

Scandent shrubs, with tendrils 2. ***S. lucens***

Shrubs, not scandent:

Branchlets inconspicuously or irregularly lenticellate when young; bark powdery farinose later; leaves 5–15 cm. long, 3–8 cm. broad; flowers large (corolla-tube c. 5 mm. long) and inflorescences pedunculate; fruits (dry) more than 7 cm. in diameter

3. ***S. innocua***

1. Continued from Kew Bull. 1956: 158.

2. Bull. Soc. Roy. Bot. Belge. 85: 24 (1952).

Branchlets clearly lenticellate when young ; bark very dark (\pm black), not powdery farinose ; leaves 2–7 cm. long, 1–4 cm. broad ; flowers small (corolla-tube c. 3.5 mm. long) on sessile in florescences ; fruits (dry) up to 7 cm. in diameter

4. ***S. dysophylla***

1. ***Strychnos pungens*** Solered. in Engl. & Prantl, Natürl. Pflanzenfam. 4. (2) : 40 (1892) and (*descr. ampl.*) in Engl., Bot. Jahrb. 17 : 554 (1893) ; Gilg in Engl., Pflanzenw. Ost-Afr. C : 310 (1895) ; Fl. Trop. Afr. 4 (1) : 530 (1903) ; Duvign. in Bull. Soc. Roy. Bot. Belge 85 : 25 (1952). Types : Angola, Huila Province, Monino forests, *Welwitsch* 4778 (B, syn., destroyed ; BM & K, iso-syns. !) ; Tanganyika, Salada, *Fischer* 374 (B, syn., destroyed ; BM & EA, isosyns. !).³

S. occidentalis Solered. in *l.c.* and as syn. in *l.c.* 555 ; Fl. Trop. Afr. 4 (1) : 530 (1903), as syn. Type not cited ; united with above in Solereder's second reference.

S. henriquesiana Bak. in Bol. Soc. Brot. 11 : 86 (1893) and in Fl. Trop. Afr. 4 (1) : 528 (1903). Type : Angola, Malange Province, *Marques* 13 (K, holo. !).

S. sapini de Wild. in Compagnie du Kasai 382 (1910). Type : Belgian Congo, Biange, *Sapin* s.n. (BR, holo. ; K, iso. !).

The above undoubtedly constitute one species, which comprises small trees of the savannah with very large fruits. It is well characterised by the moderately thick leaves which have a pair of very strong submarginal nerves, shining adaxial surface and an apical spine. This spine, although it may be short in some cases, is always a hard distinct sharp point not to be described as a mere mucro or apiculus. The leaves vary greatly in breadth ; from 1–4 cm. broad, as far as they have been observed ; these may not be the actual limits. The older bark is cream coloured and very powdery when dry.

BELGIAN CONGO. Biange, *Sapin* s.n.

TANGANYIKA. Tabora District : Kaliuwa, *Ramadhani Shabani* 26 in *Bullock* and Tabora, *Jackson* 23 and Simbo Reserve, *Wigg* 1157 and unlocalised, *Wallace* 24 ; Singida District : on road to Muwera, *B. D. Burt* 1385 ; Songea District : unlocalised, *Busse* 733.

NORTHERN RHODESIA. Abercorn, *Bullock* 1091 ; Solwezi District : unlocalised, *Trapnell* 1589 and Solwezi, *Milne-Redhead* 473 ; Mwinilunga District : Congo-Zambesi watershed, *White* 3355 ; near (N.) Senanga, *Codd* 7320 ; Livingstone District : Dambwa forest Reserve, *White* 1873 ; highlands of Batoka country, *Kirk*.

NYASALAND. Unlocalised, 23 May 1919, *Johnson in Riddelsdell* ; near Kasunga, *Brass* 17432.

SOUTHERN RHODESIA. Beatrice, *Eyles* 4545 ; Salisbury, *Eyles* 4544.

ANGOLA. Huila : Monino forests, *Welwitsch* 4778 ; Malange : *Marques* 13 & *Gossweiler* 1120, 1122 & 1282 ; Benguella : Ganguela and Ambuella country, *Gossweiler* s.n.

SOUTH AFRICA. TRANSVAAL. Nylstroom, *Burt* 2101 & *Prosser* 1736 ; Waterberg, *Hutchinson* 1884 ; Magaliesberg, *Zwartuggens*, *Sutton* 1018 ; Magaliesberg, near R. Aapies, *Schlechter* 3621 ; Magaliesberg, unlocalised, *Mclea* 5710 & *Worsdell* s.n. & *Burke* 56 ; Pretoria, *Rehmann* 4161 & *de Winter* 393 ; Rustenberg, *Young* 3001 ; Johannesburg, *Giffillan* 6153.

SOUTH WEST AFRICA. Oramboland, near Oshikango, *Rodin* 2663.

3. The other syntypes of *S. pungens* were destroyed during the Second World War and no duplicates of them have been traced at Kew, the British Museum (Nat. Hist.) or the East African Herbarium.

2. ***Strychnos lucens* Bak.** in Kew Bull. 1895 : 97 (1895) ; Fl. Trop. Afr. 4 (1) : 524 (1903). Type. Angola : Luanda Province, *Welwitsch* 6015 (BM, holo. ! ; K, iso. !).

S. milneredheadii Duvign. & Staquet in Bull. Soc. Roy. Bot. Belge 84 : 69 (1951), excl. *Greenway* 4896.

This species is one of the forest climbers of the Section ; *S. milneredheadii* is not in our opinion separable from it. It is unfortunate that the description accompanying this latter name was taken from a flowering specimen whereas *S. lucens*, in the strict sense, was originally described from fruiting material which makes true comparison impossible ; *Stolz* 923 shows both states.

A range of material from Tanganyika, Northern Rhodesia and Angola has been examined and it is found that *S. lucens* varies very greatly in leaf-size, leaf-shape, fruit-size and number of seeds. The majority of specimens from Tanganyika and Northern Rhodesia have larger leaves than those from Angola, but there are several exceptions (*Angus* 462 & 912, *Lindman* 723, *Tanner* 1901 and *White* 3823) which bear a few small leaves in addition to their large ones ; this character is therefore not of specific value. It is further observable that relative breadth of the leaves when mature may very well depend upon the amount of water available to the plant. In particular, very broad leaves are found on *Milne Redhead* 642 from "Brachystegia woodland" while narrow ones occur on *Angus* 462 from an "island in the river" and on *F. White* 3221A which was "growing in fringing forest" ; other specimens show similar tendencies to a degree sufficient to warrant the attention of field-workers being drawn to the phenomenon. Fruit-size is, to some extent, dependent upon maturity ; fruits from one Tanganyika gathering (*Tanner* 1901) vary from 3-6 cm. in diameter whereas in *Angus* 462 the only fruit is 1.6 cm. in diameter and even among the *Welwitsch* specimens from Angola the variation in this measurement is 1-2 cm. This range in size has also been observed in *S. cocculoides*.

In our opinion, the important features of the species are the thickly coriaceous leaves, usually glossy adaxially and with reticulate venation, the closely lenticellate twigs and the thick corolla-lobes which are shorter than the tube and glabrous except for a ring of hairs at their base (in the throat of the corolla-tube). *S. lucens* is allied to *S. scheffleri* in its climbing habit, bifurcate tendrils, many-seeded fruits and in the general appearance of the leaves, but can be distinguished by its lenticellate terete twigs, the thickened corolla-lobes and the sessile stamens inserted in the corolla-throat.

TANGANYIKA. Mwanza District : Buchosa Chiefdom, *B. D. Burt* 6578 and Ibondo, *Tanner* 1557 and Butimba, *Tanner* 1901 ; Tabora District : Ugalla R., *Lindeman* 733 ; Mwapwa District : Kikioombe, *B. D. Burt* 4794 and unlocalised, *Hornby* 696 ; Rungwe District : Kyimbila, *Stolz* 923.

SOUTHERN RHODESIA. Inyamadzi valley, *Swynnerton* 1075.

NORTHERN RHODESIA. Chibila river, *Trapnell* 1120 ; Luanshya, *Fanshawe* 1402 ; Solwezi District : Mutanda river bridge, *Angus* 462 and Kafumbkokoto, *Milne-Redhead* 642 and Solwezi, *White* 3221A ; Ndola : Golf course, *Angus* 912 and Chichele Reserve, *White* 3823 & unlocalised, *Fanshawe* 1575 & 1620 ; Mpika District : 37 miles S. of Shiwa Ngandu, *White* 3786 ; Mwinilunga District : Matonchi river, *Milne-Redhead* 2947.

ANGOLA. Luanda Province : *Gossweiler* 299 & *Welwitsch* 6015.

3. ***Strychnos innocua*** Del., Cent. Pl. Afr. 53 (1826) ; DC., Prodr. 9 : 17 (1845) ; Baker in Fl. Trop. Afr. 4 (1) : 532 (1903) ; A. Chev. in Rev. Bot. Appl. 27 : 360 & fig. 15 (1947) ; Bullock & Miss Bruce in Kew Bull. 1938 : 46 (1938) *pro parte*. Type (not seen) : probably by, the Blue Nile on the A.-E. Sudan-Ethiopia boundary, "Quamamyl" Cailliaud.

It is not known whether the specimen that was originally discovered of this species was preserved or not. Delile's latin and vernacular descriptions, however, provide a recognisable character for the plant seen and (?) collected by M. Cailliaud and moreover, since these descriptions cannot be referred to *S. spinosa* (the only other member of the genus occupying the area) they must apply to our species⁴ ; although not complete, they are not inconsistent with *S. innocua* as it is known in tropical Africa today.

The absence of a type specimen might be thought to be a sufficient reason for the rejection of the name *S. innocua* as being a *nomen ambiguum*⁵. It should be noted that the absence may not be due to the mere loss of the type specimen : there may never have been one at all. However, the second author considers this unlikely, especially as Delile follows some of his observations with "(notes of M. Cailliaud)" inferring that the remainder of the text, which includes the descriptions, was prepared directly by himself. For the present the name *S. innocua* is adopted ; even if no type specimen be discovered, it would be best to preserve the well-known name and select a neo-type specimen⁶ when the genus is monographed.

An account of the taxonomy of this species was given by Mr. A. A. Bullock and Miss Bruce in 1938.⁷ From that treatment, the present one differs mainly by the exclusion of *S. dysophylla* (see below) and by the division of our species into infraspecific taxa. Since full references to the literature and full citations of specimens are available in the earlier article, we shall here refer the synonyms and specimens to their varieties by citation of their names only, unless they are newly included.

KEY TO INFRASPECIFIC ELEMENTS.

Adaxial leaf-surface not shining, and with a conspicuous raised reticulate tertiary venation (subsp. ***innocua***) :

Leaves glabrous beneath var. ***innocua***

Leaves pubescent beneath, at least on the midrib towards the base var. ***pubescens***

Adaxial leaf-surface \pm shining, and with the tertiary venation scarcely raised and not conspicuous (subsp. ***burtonii***) :

Leaves glabrous beneath var. ***glabra***

4. Ruling out (*vide* Occam's Razor) the possibility of Cailliaud having found a species which has not been re-observed.

5. Miss Bruce had tentatively decided to do this, but see footnote 4.—J.L.

6. Several Schimper specimens exist from the Tacaze river valley, Ethiopia, which is the type-locality.

7. Kew Bull. 1938 : 45-52 (1938).

Leaves pubescent beneath, at least on the mid-
rib towards the base

var. **burtonii**

subsp. **innocua**

Plants bearing lateral shoots of orthodox annual increase in length. Leaves cuneate or rounded at the base, rarely narrowly cuneate (when young) ; both surfaces matt with a conspicuous prominent reticulate venation ; one to three pairs of lateral nerves \pm prominent and clearly visible on both surfaces.

var. **innocua**

S. unguacha A. Rich. and its varieties ; *S. alnifolia* Baker ; *S. penduliflora* Baker ; *S. xerophila* Baker (*pro parte* : Schweinfurth 1719) & *Unguacha sinuatum* Hochst.

Branches glabrous. Leaves glabrous.

GOLD COAST. Kitson 664, 775 & 834.

NIGERIA. Rowland s.n. ; Dalziel 421.

FRENCH EQUATORIAL AFRICA : Cameroons. Mildbraed 9271a.

A.-E. SUDAN. Schweinfurth 1412, 1432, 1660 & 1672 ; Muriel L/38 ; Brown 362 ; Turner 17 ; Cooke 62. N.W. EQUATORIA Province, S.W. of Wau, Ngwolima, Feb. 1939 (fl. & young fr.), Hoyle 565 ; Juba District : near Nargata rest house, 1939, Andrews 1677. KORDOFAN Province. Talodi, Apr. 1930 (fr.) Simpson 7729.

ETHIOPIA. Schimper 1817 ; Amhara District : near Gondar, base of Mt. Gunidubba, Jan. 1937 (fr.), Pichi-Sermolli 1280.

UGANDA. Eggeling 1445 ; Chandler 343 ; Dawe 830, Snowden 216 ; Karamoja District : Kakumongole, Jan. 1937 (fl. & fr.), Thomas 2239 and Napak, Feb. 1938 (fl.), Sangster 428 and foothills of Mt. Debasien above Nakiryanyet, Jan. 1930 (fl.), Eggeling 2629 ; Mubende District : near Bukomero, Aug. 1932 (fl.), Brasnett 819 in Eggeling 483 ; Bunyoro District : Kiryandongo, Mar. 1933 (fl.), Purseglove 1346.

TANGANYIKA. Wallace 13 ; Jessel 60 ; Tabora District : Usinge, Nov. 1933 (fl.), Michelmores 770 and Tabora, Simbo Reserve, Wigg 1080 and Kaliwa, Oct. 1949 (fr.) Ramadhani in Bullock ; Mwanza District, Geita, June 1937 (fl.), Burtt 6571 ; Buha District : Kibondo, Maclean H37.

SOUTHERN RHODESIA. Ag. Dept. Herb. Nos. 1200 & 1243.

NORTHERN RHODESIA. Eyles 8202 ; Ndola District : Ndola, Sept. 1948 (fl.), Trapnell 1994 and Mpongwe, Oct. 1947 (fr.), Trapnell 1977.

var. **pubescens** Solered. in Engl. Bot. Jahrb. 17 : 556 (1893). Type : Nigeria, Nupe, Barter 1160 (B, holo. destroyed ; K, iso. !)

S. triclisioides Baker & *S. xerophila* Baker (*pro parte* : Speke & Grant).

Branchlets and petioles pubescent, especially when young. Leaf-blades pubescent (often densely), always at least sparsely so on the midrib towards the base beneath.

FRENCH WEST AFRICA. Pobeguïn 860.

GOLD COAST. Kitson 909.

NIGERIA. Lely 155 & 836 ; Shaw 45 ; Dalziel 197 ; Dalton s.n.

FRENCH EQUATORIAL AFRICA. CAMEROONS. Tessman 2262 & 2439. OUBANGUI CHARI. Chevalier 7235. CHAD. Chevalier 8591.

BELGIAN CONGO. Ringoet 99 ; Elizabethville, Quarré 4718.

A.-E. SUDAN. Turner 26 ; Cooke 45 ; Brown 1347 ; Schweinfurth 1719 ; Torit District : Imatong Mts., near Molongori, June 1939, Andrews 1805 ; Eastern Kordofan ; Jebel-el-daier, Longe 79 ; Amadi District : between Maridi and Amadi, June 1937, Myers 6913.

UGANDA. *Speke & Grant* s.n. ; *Hill* 13 ; *Eggeling* 753 in *U.F.D.* 1150 ; Lango District : *Ngetta*, Dec. 1935, *Cree* 43 ; Chua District : *Abbia Ferry*, Feb. 1935, *Eggeling* 1680 & *Adilang*, *Greenway & Hummel* 7339.

TANGANYIKA. *B. D. Burt* 1387 & 3301 ; *Stolz* 1735 ; Shinyanga District : unlocalised, Nov. 1938, *Koritschoner* 1659 ; Bukoba District : Nshamba, Sept./Oct. 1935, *Gillman* 533 ; Mwanza District : Nassa, Sept. 1951, *Tanner* 456 & Mbanga, May 1953, *Tanner* 1476 ; Kigoma District : N. of Ngonia R., Nov. 1943, *Trevor* 3 & Uvinza, Aug. 1950, *Bullock* 3235.

NYASALAND. *Cameron* 168 ; Kasungu, Aug. 1946, *Brass* 17434 ; *Buchanan* 93.

NORTHERN RHODESIA. *Michelmores* 382 ; *Milne-Redhead* 792 ; Abercorn, Nov. 1952. *Robertson* 194 ; Ndola, Oct. 1937, *Duff* 232 ; Lake Tanganyika, Mbulu Island, May 1952 (fr.), *Mrs. Richards* 1661.

PORTUGUESE EAST AFRICA. Quelimane District : Namagoa, Nov. 1944, *Mrs. Faulkner* 214.

ANGOLA. *Gossweiler* 1121 & 1123.

Note. The above subspecies is well characterised by its leaves. It is true that there are plants with the upper leaf surfaces not all quite matt and some with the leaf-bases more attenuate than cuneate, but the majority are quite easily recognisable ; the veins are very distinctly raised on the upper leaf-surface. From this type subspecies, subspecies *burtonii* which follows, is separated geographically. (See map below).



Distribution of *Strychnos innocua*.

subsp. **burtonii**⁸ (*Baker*) *Bruce & Lewis* ; *comb. et stat. nov.* Type : Portuguese East Africa, Shupanga, *Kirk* 368 (K, lecto. !).

Plants often bearing very short lateral shoots with very numerous congested leaf scars. Leaves attenuate or narrowly cuneate below ; upper surface \pm shining with the tertiary venation not conspicuously prominent ; only the midrib and one pair of lateral nerves at all conspicuous, the other pair being narrow, not prominent, and submarginal.

8. Epithet deliberately chosen (by E. A. B.), against that of the earlier *S. quaua*, because of the relative quality and availability of type specimens. The lectotype is proposed, and the orthography of the name has been corrected, by the present authors.

var. **burtonii**

S. burtoni Baker *pro parte max. exclusis syntypis tribus i.e. Kirk ex litore Zambeziae* (vide var. *glabra*, infra).

S. quaua Gilg and *S. behrensiana* Gilg & Busse.

Branchlets and petioles pubescent, especially when young. Leaf-blades pubescent (often densely so), always at least sparsely so on the midrib towards the base beneath.

TANGANYIKA. *B. D. Burtt* 88 & 312 ; Iringa District : Ruaha Mtua, June 1906, *Brown* 1256 ; Lindi District : Mazanga, Jan. 1903, *Busse* 2544 & 2545 and unlocalised, *Busse* 2520, 2922 & 2925 and Rondo plateau, Mtene, Nov. 1953, *Eggeling* 6724 ; Mwera plateau, *Busse* 2616 & 2877.

ZANZIBAR. 1859 (fr.) *Burton* s.n.

NYASALAND. *Waller* in *Kirk* s.n.

PORTUGUESE EAST AFRICA. *Kirk* 368, *Stuhlmann* 1041 (photo. in K !) ; *Swynnerton* 1076, 1077 & 1959 ; *Honey* 753.

var. **glabra** Bruce & Lewis, var. nov. ; a var. *burtonii foliis glabris distinguatur*. Type : Tanganyika, Tanga District, Kwamkembe-Pongwe. Jan. 1937, *Greenway* 4851 (EA, holo. !).

S. melonicarpa Gilg & Busse and *S. stenoneura* Gilg & Busse—both in Engl., Bot. Jahrb. 36 (1905). Types : *Busse* specs. in EA. (iso. ! & iso.-syn.

S. burtoni Baker, *pro parte min., scilicet quoad syntypos tres, i.e. Kirk ex litore Zambeziae*.

Branchlets glabrous, even those of the first year. Leaves perfectly glabrous, even on the midrib towards the base beneath.

KENYA. COAST PROVINCE. Kwale, Nov. 1928 (fl.), *Graham* 237 and Mowesa, April 1929 (fr.), *Graham* 297.

TANGANYIKA. Tanga District : Tanga, Dec. 1935, *B. D. Burtt* 5366 and 5 mls. S.E. of Ngomeni, Aug. 1953, *Drummond & Hemsley* 3611 ; Lushoto District : Kwasemaiko, Oct. 1940 *Greenway* 6035 ; Handeni District, Kangata, Nov. 1949, *Semsei* in *F.H.* 2895.

PORTUGUESE EAST AFRICA. Kongone, Nov. 1859, *Kirk* s.n. & Jan. 1861, *Kirk* s.n. and unlocalised, Oct. 1866, "300 ft.", *Kirk* 96 ; Zambezia, Alto Molocua, Oct. 1949, *Barbosa & Carvalho* 4440.

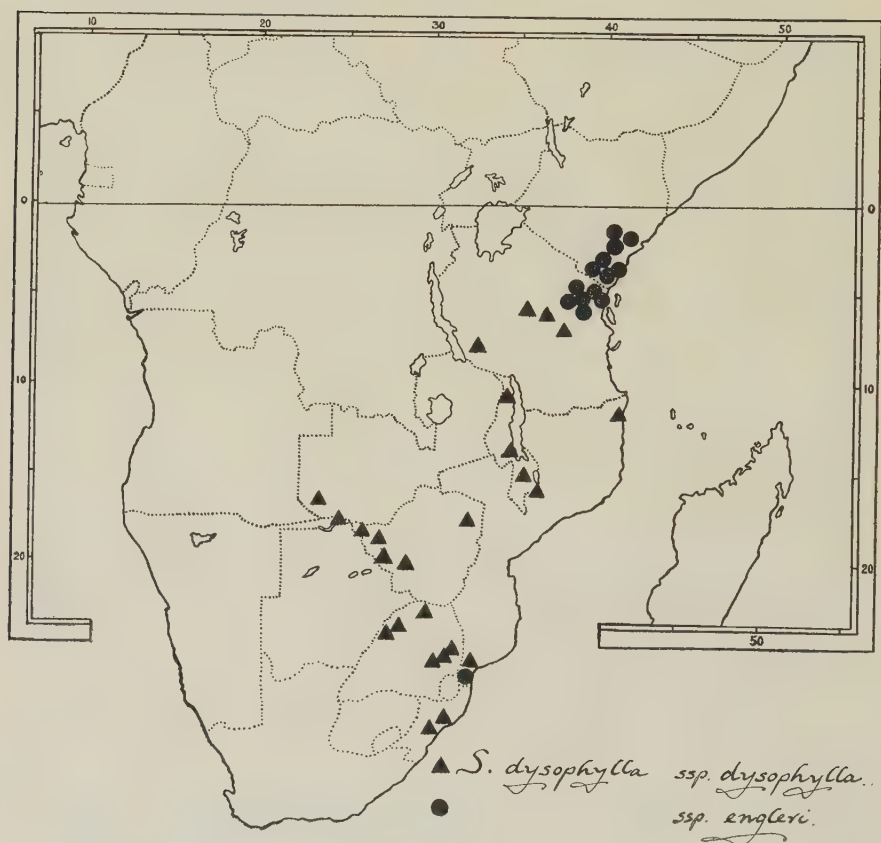
SOUTHERN RHODESIA. Matopos, Matobo, July 1952, *Hodgson* 7 in *Gout. Herb. No.* 41642.

Note. The degrees of affinity between the individuals within this species are extremely difficult to determine, and the same is true of *S. dysophylla* (below) ; the two species themselves are very closely related and intermediates (which are considered therefore to be hybrids) occur.

The division of this species into taxa of the ranks given was indicated by Miss Bruce in some manuscript partly drafted for the Flora of Tropical East Africa. The second author has made the necessary nomenclatural changes in the way he believes she would have wished. While doing so, however, he feels obliged to make the reservation that, although these infraspecific taxa undoubtedly do exist, it may be that their significance has been overvalued in the above scheme. The varieties based on hairiness for example, might be better regarded merely as forms and the species itself could be united with *S. dysophylla*, the whole being re-divided differently into two subspecies. In deciding to adopt the ranks given here he has allowed due weight to Miss Bruce's much longer experience as a taxonomist and, especially, to her very superior knowledge of the genus. Furthermore, the present scheme agrees in its level of species-conception with the treatment of the other members of the genus that has been presented in the previous articles in this series.

4. **Strychnos dysophylla** Benth. in Journ. Linn. Soc. 1 : 103 (1857) ; Baker in Fl. Trop. Afr. 4 (1) : 533 (1903) ; Fl. Cap. 4 (1) : 1054 (1909). Type : Portuguese East Africa, Delagoa Bay, *Forbes* s.n. (K. holo. !).

This species is accepted, despite its very close relationship to *S. innocua*, because its delineation within the scheme presented in this article enables a full account to be given of the variation throughout this Section. Until the genus is revised as a whole it is undesirable to conceal the variation under a widely conceived specific name, even although in the present case there is not perfect correlation of the characters used to separate the two species. Therefore, although the treatment given by Mr. Bullock and Miss Bruce may be substantiated when the final analysis is made, its adoption was premature.⁹



subsp. **dysophylla.**

S. randiformis Baill. in Bull. Soc. Linn. Paris 1 : 246 (1880). Type : Portuguese East Africa, Delagoa Bay, Forbes 62 (P, holo.).

Branchlets brown, thinly lenticellate (when young) ; lateral branchlets short with very congested leaf scars. Leaves usually membranous, pubescent, at least on the nerves beneath (upper surface sometimes shining), tertiary venation not very conspicuous. Fruits glaucous green, up to 7 cm. diameter but usually smaller.

9. Workers in other fields, especially those in South Africa (where, of the two, only *S. dysophylla* occurs) may retain the name *S. innocua* for material of the present species by suffixing to it "sensu latissimo" or "sensu Bullock & Bruce".

TANGANYIKA. Dodoma District : Meamea (? Meia Meia), Aug. 1928, *Greenway* 798 and Kilimatindi, Apr. 1908, *Claus* 1658 ; Mpwapa, Dec. 1931, *Hornby* 428 ; Ufipa District : Namwele, Feb. 1950, *Bullock* 2577.

SOUTHERN RHODESIA. Suskwe R., Mtoko, Dec. 1953 (fl.) *Phelps* 82 in *G.H. No.* 44852 ; 150 mls. S. of Victoria Falls, May 1948 (fr.), *Rodin* 4510 ; Victoria Falls, July 1930 (fr.), *Hutchinson & Gillett* 3494 ; Bulawayo District : Mchabezi R., Nov. 1941 (fl.) *Hopkins* in *G.H. No.* 8269 ; Wankie, June 1920, *Rogers* 13407 ; Fort Victoria District : Umshandige, Oct. 1949 (fr.) *Wild* 3076 in *G.H. No.* 25213.

NORTHERN RHODESIA. Sesheke, Jan. 1952 (fr.), *White* 1990 ; 2 mls. N. of Nangueshi, July 1952 (fr.), *Codd* 7130.

NYASALAND. CENTRAL PROVINCE. Near Salima, July 1936, *Burt* 6075 ; SHIRE HIGHLANDS. July 1885 (fl.), *Buchanan* 478 ; NORTHERN PROVINCE. Rumpi, June 1952, *Trump* 63.

PORTUGUESE EAST AFRICA. NIASSA PROVINCE. Between Msala and Mocimboa, Sept. 1921, *Pedro & Pedrogos* 5196.

SOUTH AFRICA. NATAL. Mtunzini Division : Tugela, *Gerrard* 1660 ; Nongoma Division : on the Black Umfolozi R., July 1936, *Verdoorn* 1705 and unlocalised, *Lehmann* s.n. ; TRANSVAAL. Zoutpansberg Division : Messina, on Limpopo R., Dec. 1928 (fl.) *Hutchinson* 2108 & 2126 and unlocalised, 1936, *Smuts & M. C. Gillett* 4084 ; W. of Blueberg and Hangklip Mts., Nov. 1871 (fl.), *Baines* s.n. ; Kruger Nat. Park, Pretorius Kop, Oct. (fl.), *Story* 3928 & Mar. 1948 (fr.) *Rodin* 4143 and Malelane Camp, N. bank of Crocodile R., Sept. 1948 (fl. & fr.), *Codd* 4367 ; Potgietersrust Division : Magonta R., Dec. 1931 (fl.), *Galpin* 11624 in *N.H. No.* 14361.

subsp. **engleri** (*Gilg*) *Bruce & Lewis* ; *comb. et stat. nov.* Type : Tanganyika, Nyika steppe, March 1893, *Holst* 2420 (K, holo. ! HBG, iso. !).

S. engleri *Gilg* in *Engl., Bot. Jahrb.* 17 : 568 (1893) ; *Pflanz. Ost-Afr. C* : 310 & t. 38 (1895) ; *Baker* in *Fl. Trop. Afr.* 4 (1) : 532 (1903). Types : Tanganyika, *Holst* 2420 (B, syn. destroyed ; K & HBG, iso-syn. !) and Bagamoyo, *Stuhlman* 8 & 209 (B, syn. destroyed).

S. wakefieldii *Baker* in *Kew Bull.* 1895 : 98 (1895) and in *Fl. Trop. Afr.* 4 (1) : 532 (1903). Type : Kenya, Mombasa, *Wakefield* s.n. (K, holo. !).

Branches greyish, usually densely lenticellate ; lateral branchlets showing distinct although sometimes short annual increase in length. Leaves \pm coriaceous, glabrous shining on both surfaces, reticulate tertiary venation often prominent. Fruits green, ripening to yellow or dull orange (black when dry), usually about 3 cm. diameter.

KENYA. Mombasa District : Port Tudor, *MacNaughton* 90 in F.D. 2622 ; Kilifi District : near Roka, June 1937, *Dale* 3803 and Arabuko, Mar. 1930, *Graham* 2292 in *C.M.* 15160 and Fumbani, Sept. 1936, *Swynnerton* 47 ; Kwale District : between Samburu & Mackinnon Road, Aug. 1953, *Drummond & Hemsley* 4077 and Mackinnon Road, July 1939, *MacArthur* 228 ; Teita District : Mt. Kasigau, Sept. 1938, *Joana* 8895.

TANGANYIKA. Tanga District : 5 mls. S.E. of Ngomeni, July 1953, *Drummond & Hemsley* 3570 and Amboni, June 1893, *Holst* 2711 ; and Kibuguni, Nov. 1936, *Greenway* 4761 and Ngole, June 1937, *Greenway* 4938 ; Handeni District : N. of Kiberaschi, Sept. 1933, *B. D. Burt* 4896 ; Lushoto District : Makuyuni, June 1935, *Kortischoner* 1179.

PORTUGUESE EAST AFRICA. S. of Lourenço Marques, 2 km. E. of Porto Enriques, Aug. 1948, *Sousa* 3804.

Note. There are two other species which may be regarded as synonymous to which attention must be drawn. They are from Natal ; *S. gerrardii* N. E. Brown¹⁰ and *S. baronii* Baker¹¹. Both are very close to our subsp. *engleri* but differ in having leaves which are less coriaceous and less shining ; also the leaves of *S. gerrardii* are inclined to be acuminate and those of *S. baronii* are distinctly so. A firm decision on the relationship of these to the East African species is left to a monographer of the genus.

10. in *Kew Bull.* 1896 : 162 (1896).

11. in *Journ. Linn. Soc.* 22 : 504 (1887).

Argentine Woods and Forests.*—That there has, during the past 20 or more years, been an ever-increasing interest in forests, trees and timbers from different parts of the world is shown by the considerable number of regional reference books concerning them that have been published. There has, however, until now been no up to date and comprehensive treatise dealing with the forests and timbers of Argentina. Professor F. A. Tortorelli's recently published book on the subject will therefore receive a ready welcome from all those who are in any way concerned with the forests of Argentina or the timbers derived from them. Professor Tortorelli's work on wood structure is already well known outside his own country, especially to his fellow members of the International Association of Wood Anatomists. This in itself is a sufficient guarantee that the book is one that can be recommended with confidence.

The book, which is well bound, and printed on paper of good quality, is divided into 6 chapters, the first being concerned with the forests, and the remainder with various aspects of the timbers derived from them. In Chapter II the author deals with the colour, texture and grain of the timbers, as well as with their macroscopical and microscopical characters, physical, mechanical and chemical properties, and abnormalities in structure. In the third chapter the species are dealt with individually, the arrangement being by botanical families, and covering both coniferous and dicotyledonous trees. Besides descriptions of the timbers, their vernacular names are given, together with notes on their geographical distribution and cultural characteristics. The species dealt with under each family are, for the most part, restricted to those of which the timbers are used commercially. Chapter IV consists of a key to the identification of Argentine timbers, and Chapter V of photomicrographs, of good quality, showing transverse, tangential and radial sections of the woods of 111 species, with lists of their diagnostic characters on the pages facing the photographs. There is a useful Bibliography, and separate indexes to illustrations, tables of quantitative data, and to vernacular and scientific names. Besides the photomicrographs, there are numerous other illustrations showing the trees in their natural surroundings and selected areas of forest. Unlike the photomicrographs, these are of rather variable quality, and a few of them, such as Figs. 98 and 102, are definitely poor. These are but small blemishes, however, in a book which will no doubt take its place as a standard work on the timbers of Argentina, and it will be found useful even by those whose knowledge of Spanish is limited.

C. R. METCALFE.

* *Maderos y Bosques Argentinos*. By Lucas A. Tortorelli. Pp. xxvii + 910. With 111 sets of photomicrographs and 104 photographs in the text. Buenos Aires, Editorial Acme, S.A.C.I. 1956; \$350-m/arg.

CONTRIBUTIONS TO THE FLORA OF AUSTRALIA : III.

The *Ranunculus sessiliflorus* complex in Australia.

R. MELVILLE

All the Australian representatives of the section *Echinella* of *Ranunculus* were placed by Bentham (Fl. Austral., 1, 14, 1863) under *R. parviflorus* L. var. *australis* Benth. In recent years, botanists have recognised that the Australian plants are specifically distinct from *R. parviflorus* L. and have adopted the name *R. sessiliflorus* R. Br. ex DC. for the whole of this variable group. Reference to the type specimens of Robert Brown's species in the herbarium of the British Museum confirmed that the latter name, if critically applied, belongs to those plants that possess reniform, tripartite, coarsely toothed leaves and flattened achenes with few to moderately numerous stout papillae, terminating in stiff curved hairs. The other Brownian name applicable to this group, *R. pumilio* R. Br. ex DC., covers plants with the tripartite leaves dissected into lanceolate or linear segments and plump, lenticular achenes with their lateral faces more or less densely covered with very small papillae bearing stiff curved hairs, that usually hide the papillae. These two names define the two ends of a graded series of forms linked together by plants with intermediate combinations of characters. Plants of an intermediate character are, however, far less numerous than those of the two principal groups. The name *R. pilulifer* Hook. was given to a plant with dissect leaves and flattened coarsely papillate achenes.

In addition to the above mentioned forms, J. M. Black described another variant with very strongly flattened, sparingly tuberculate achenes and intermediate or finely cut leaves as *R. parviflorus* L. var. *glabrescens* (Fl. S. Austr., Ed. 1, pt. 2, 237, 1924). Then in the following year (Trans. Roy. Soc. S. Austr., 49, 113, 272, 1925) he gave specific rank, as *R. pentandrus*, to plants that differed, substantially, only in the possession of smooth achenes. Later on, Black (Fl. S. Austr., Ed. 2, pt. 2, 363, 1948) united *R. pentandrus* with his var. *glabrescens*, recognising that the absence of tubercles was not a character of specific value. Smooth achenes occur, also, in plants that otherwise possess the characters of *R. pumilio*.

From the preliminary survey, it appeared that *R. pentandrus* could be separated from other members of the complex, without difficulty, on achene characters and that the intergrading forms between *R. sessiliflorus* and *R. pumilio* were comparatively few in number. A more detailed study of leaves, flowers and fruits within the group was therefore undertaken to determine whether it constitutes one, three or more species. Advantage was taken of the presence in Europe of collections of *Ranunculi* from the National Herbaria of Brisbane and Melbourne and I have to thank the Directors of those institutions for making their material available to me. With the collections of Kew and the British Museum, a total of 106 gatherings was open to analysis. For the purposes of the investigation, five grades were recognised in the degree of dissection of the leaves, of the plumpness of the achenes and of the number of papillae on the achenes. The radical and lower cauline leaves were used to assess the leaf characters (Fig. 1). In judging the plumpness of the achenes, the tubercles were disregarded. The achenes vary from almost paper

thickness in *R. pentandrus* to a plump lenticular shape in *R. pumilio* (Fig. 2). The tubercles were assessed for number only and not for size. The number was estimated along a line transect, about two tubercle bases in width, transversely across the middle of one face of the achenes, the five grades being : 0, 1-5, 6-10, 11-15, 16-20+. The grading of all three characters is arbitrary and the placing of a plant in its grade is liable to subjective error. The occasional misjudgment of a plant by one grade, however, is not likely to have had any significant effect on the final groupings obtained in the analysis. For conciseness, the grades are referred to below as L 1-5 for leaves, A 1-5 for achene thickness and T 1-5 for tubercle number.

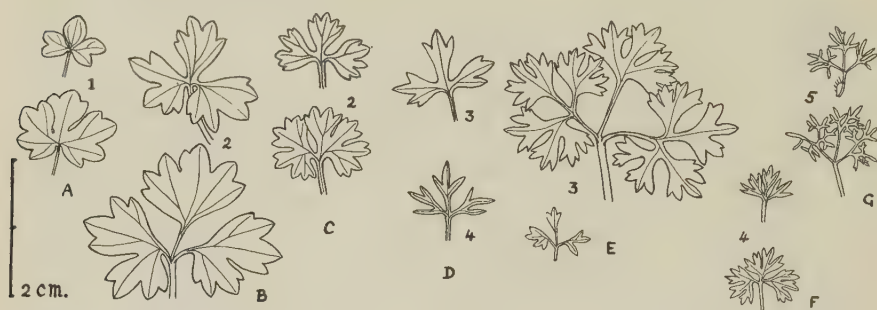


FIG. 1. Middle and lower cauline leaves of the *Ranunculus sessiliflorus* complex, with their grades of dissection (numerals).

A.-C. *R. sessiliflorus*, A from Melville 1028, B from Melville 701, C from Robinson, Windae Vale ; D. *R. pentandrus*, upper from Max Koch 198, lower from Tate, Lake Torrens ; E. *R. pumilio*, upper from Comber 1628, lower from Gunn 230/1842, Woolnorth ; F. *R. pumilio* var. *politus* from Reader, Lowan ; G. *R. sessiliflorus* var. *pilulifer*, from Drummond, Swan River. All same scale.

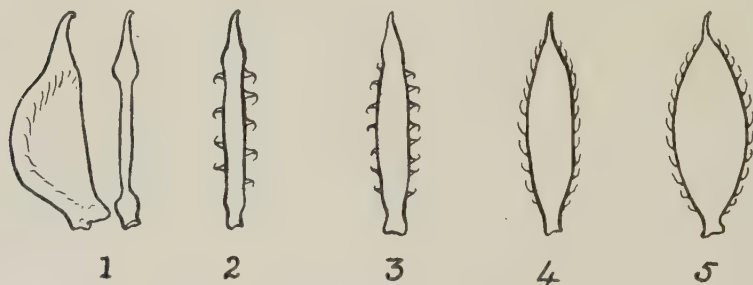


FIG. 2. Five grades of achene thickness.

The distribution of the observations can be represented in a three dimensional diagram—a cube. As the distribution inside the cube cannot be adequately represented in two dimensions, the device of cutting up the cube into slices parallel with the three axes of reference has been adopted. Thus in Fig. 3, centre, the five major squares A 1-5 represent the five slices that should be superimposed in numerical order. The dissections along the other axes at right angles, T 1 : L 1-5, etc. and L 5 : A 1-5 etc., are shown respectively to left and right. Comparison

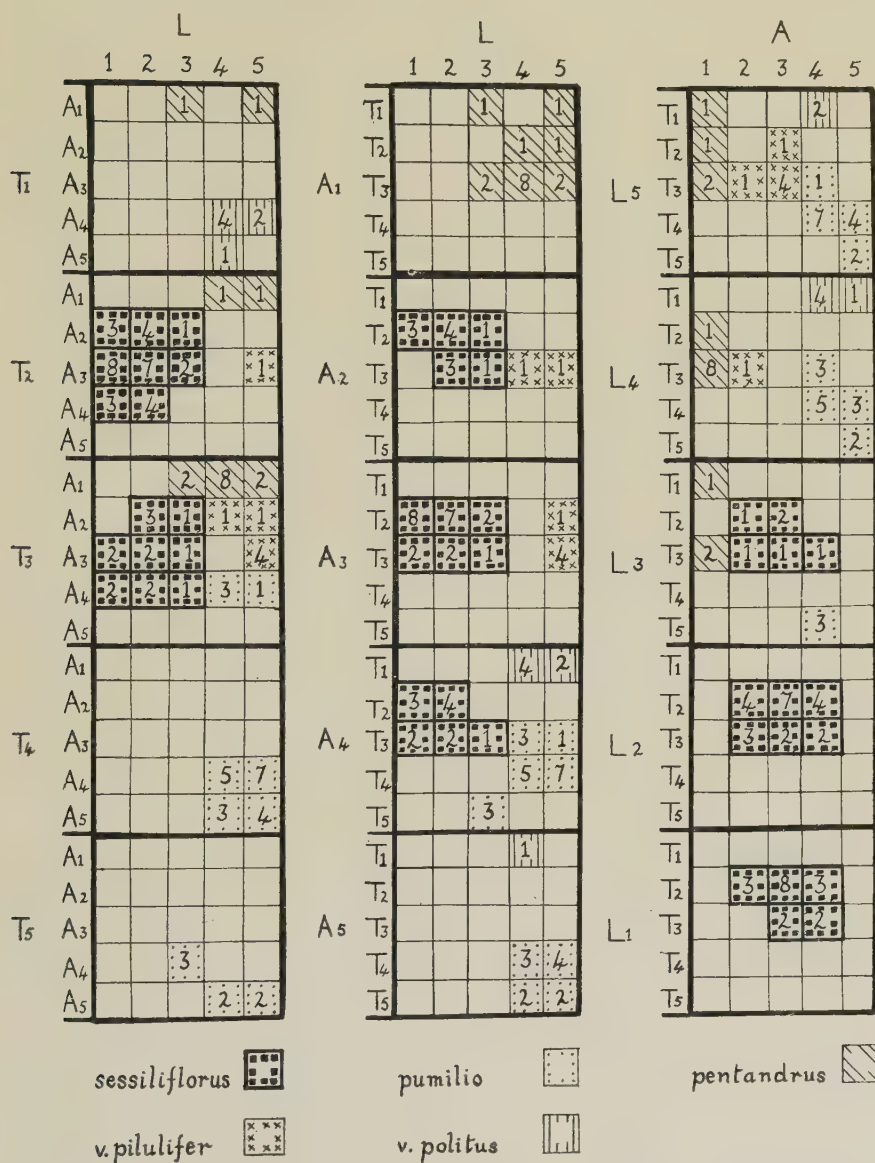


FIG. 3. The association of character grades within the *Ranunculus sessiliflorus* complex. L—leaf, A—achene thickness, T—tubercle number. The number of times each combination of characters occurred is shown by the numerals in the minor squares.

of the three dissections will enable the distribution within the cube to be visualised. The number of times each possible character combination occurred among the plants examined is marked in the minor squares. It is at once noticeable that many character combinations are not represented; either they do not occur at all, or they are too rare to be encountered in a relatively small sample of the *Ranunculus* population. On the other hand, it can be seen that certain character combinations occur rather frequently and these combinations tend to group themselves

about certain centres within the cube, which may be called centres of variation. Combinations of intermediate frequency tend to be arranged along particular axes that include the centres of variation. These more or less linear concentrations may be regarded as axes of variation.

Bearing in mind the principles enunciated above, it can be seen that *R. pentandrus* is discriminated by its thin achenes, being confined to the A 1 slice with a centre of variation at T 3-L 4. (Fig. 3, centre). The centre of variation of *R. sessiliflorus* lies in A 3, T 2, L 1-2 and its axis of variation in T 2, A 2-4, L 1-2 (Fig. 3, left). In *R. pumilio* the centre of variation lies in T 4, A 4, L 4-5, in a part of the cube remote from that of *R. sessiliflorus*. The axis of variation of *R. pumilio* does not stand out very clearly, due to the fact that it is oblique to the principal axes of the cube. It passes across A 4-5 through T 3-5 in L 4-5 (Fig. 3, right). If we allow the two adjacent minor squares containing the maximum numbers to form the centres of variation, then three entities can readily be distinguished with totals of 15, 12 and 10 entries in their respective centres. Roughly one third of the whole population sampled is concentrated, therefore, in three widely separated centres of variation. Coupled with the presence of three axes of variation inclined at different angles to one another, this is considered strong evidence for the existence of three species rather than one.

The lesser variations within the group must now be considered. The common forms of *R. pentandrus* are tuberculate and the type variety is much less frequent, but achene characters clearly set apart this species from the remainder of the group. The remaining variants fall into two groups: those that Hooker called *R. pilulifer* and a hitherto unnamed group with smooth achenes and dissect leaves. Apart from their dissect leaves, the 'pilulifer' forms agree most closely in floral and fruit characters with *R. sessiliflorus* and they seem most fittingly placed as a variety of that species. It will be observed, however, that they fall in the diagram (Fig. 3, right) into positions that prolong the oblique axis of variation of *R. pumilio* and thence link it up with *R. sessiliflorus*. There is a possibility, therefore that these plants are a product of hybridisation and indicate introgression of *R. pumilio* genes into *R. sessiliflorus*. The second group of variants resemble *R. pumilio* in achene shape and most other characters except for their lack of hairs and tubercles on the achenes. The smooth achene separates them in the diagram, but the group of observations falls directly above the centre of variation of *R. pumilio* (Fig. 3, left). In the plants examined, there are usually three sepals, as in *R. sessiliflorus* rather than five as in *R. pumilio*. The surface of the achenes, under the microscope, has a smooth appearance with small cells, as in *R. pumilio*, rather than the slightly dimpled, large-cell pattern of *R. sessiliflorus* and *R. pilulifer*. On the balance, they are nearest to *R. pumilio*, with which they are placed below as a new variety.

Augmented descriptions of the species and varieties here recognised within the *R. sessiliflorus* complex are given below. A selection of specimens is cited to indicate the range of distribution of the taxa. These are from the herbaria indicated by initials as follows: A, Adelaide Botanic Gardens; B, State Herbarium, Brisbane; K, Royal Botanic Gardens, Kew; L, British Museum, Natural History; M, National Herbarium, Melbourne.

Key to the Australian species and varieties of *Ranunculus*, section *Echinella*.

Leaves ternate or palmatisect with lanceolate or linear lobes

Achenes smooth

Achenes very thin, flattened and \pm twisted, leaves and stems glabrous or glabrescent *R. pentandrus* var. *pentandrus*

Achenes lenticular, not twisted, leaves \pm pilose

R. pumilio var. *politus*

Achenes with tubercles bearing curved hairs

Tubercles rather small, scattered, but confined mainly to the middle of the lateral faces, achenes very thin, flattened and twisted

R. pentandrus var. *glabrescens*

Tubercles very small, numerous, covering the faces of the \pm lenticular achenes *R. pumilio* var. *pumilio*

Tubercles conical, prominent, scattered over the lateral faces of the achenes *R. sessiliflorus* var. *pilulifer*

Leaves palmatifid to palmatisect, coarsely toothed or lobed, achenes with prominent conical tubercles scattered over their lateral faces

R. sessiliflorus var. *sessiliflorus*

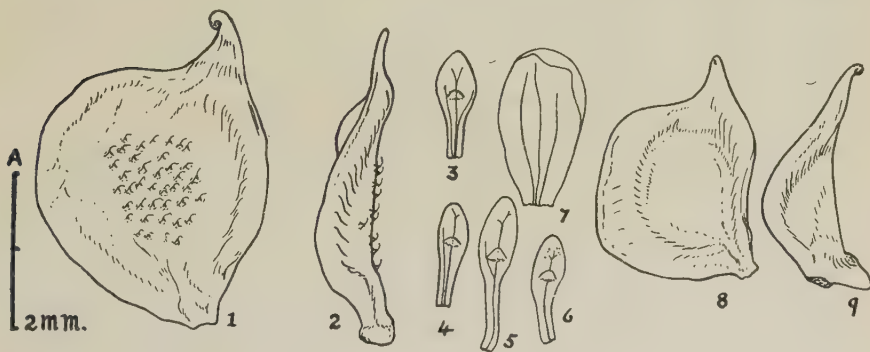


FIG. 4. *Ranunculus pentandrus* J. M. Black. 1-7 var. *glabrescens* (J. M. Black) Melville; 8-9 var. *pentandrus*, from isotype; 1-2, 8-9, achenes; 3-6, petals; 7, sepal; 1-4, 7, from Max Koch 198; 5, from A. Winfel, Upper Darling; 6, from C. T. White 9555, Roma, note isolated starch cells. All scale A.

***Ranunculus pentandrus* J. M. Black** in Trans. Roy. Soc. S. Australia, 49, 272 (1925).

Annual herb with stems 2-20 cm. long, branching from the base, glabrous, or sparingly pilose below. Seedling leaves with lamina ovate, entire, 3-6 mm. long, later leaves trifid, adult leaves 1-2 cm. broad, ternate and ternately dissect into lanceolate to linear lanceolate lobes, glabrous or sometimes sparingly pilose, petioles 1.5-5 cm. long, with \pm hyaline basal sheaths usually long ciliate, upper bracts linear, about 4-6 mm. long. Flowers 2-3 mm. diameter, upper subsessile, lower pedicellate with fruiting pedicels to 3.0 cm. long. Sepals 3-5, about 1.7-2.0 mm. long, elliptic to obovate-oblong, hyaline, 3 nerved, with the

lateral nerves often poorly developed. Petals 1-2, 1.5-2.0 mm. long, elliptic to ovate spatulate, white, without a starch containing zone, but sometimes with a few isolated starch cells, 1-3 nerved, the laterals poorly developed and the central nerve usually forked near the tip, nectary $\frac{1}{2}$ - $\frac{2}{3}$ petal length from the base, a simple semi-circular to semi-elliptic flap with a thin line of secretory tissue. Stamens 3-5. Carpels 6-20. Achenes suborbicular to broadly ovate, with a short, smooth, triangular beak, 2-3 mm. long, strongly flattened and \pm twisted with the smooth margins slightly thickened, pale reddish brown. Receptacle glabrous.

var. **pentandrus**. Lateral faces of the achenes smooth, without tubercles. (Fig. 4, 8-9).

S. AUSTRALIA : Flooded country, Minnie Downs, near Warburton River, *L. Reese*, 1924. Holotype, A ; isotype, K ; Pandie Pandie, Diamantina River, Cleland, 16.8.1934. A.

QUEENSLAND : Darling Downs, *Law* in Herb. Mueller, M.

var. **glabrescens** (*J. M. Black*) *Melville*, comb. nov. ; *R. parviflorus* L. var. *glabrescens* J. M. Black in Fl. S. Austral., ed. 1, 237 (June 1924) et Trans. Roy. Soc. S. Australia, **48**, 254 (Dec. 24, 1924). Lateral faces of achenes with scattered short conical tubercles terminated by a recurved bristle. (Fig. 4, 1-7).

S. AUSTRALIA : Renmark, *Anon.* (probably *J. M. Black*) 3.10.1915. Lectotype. A ; Idyaka, *Anon.* (? *Tate*), 2.9.1883 et 3.9.1883, A ; Lake Torrens Plain, *Tate*, 2.9.1883, K ; Blanchetown, *Anon.* (? *Tate*) A ; Mt. Lyndhurst, *Max Koch*, 198, Aug. 1898, K, B ; Arcoona, *Murray* 159, 18.9.1927, A ; 22 ml. W. of Oodnadatta, *Cleland*, 5.8.1933, A ; Mt. Barry, 60 ml. S. of Oodnadatta, *Ising*, 26.8.1951, A.

NEW SOUTH WALES : Wentworth, *Mrs. Farr*, Herb. Mueller, M. ; Upper Darling, *A. Winfel*, 1886, Herb. Mueller, M. ; Coonamble, *J. Larmont*, 1883, L.

QUEENSLAND : Adavale, Warrego District, *W. MacGillivray*, 28.8.1923, B ; Caiwarro, Burke District, *K. I. Morris* 7, 3.8.1936, B ; Roma, *C. T. White* 9555, 25.10.1933, B ; Yelarbon, Darling Downs District, *C. T. White*, Oct. 1919, B ; Darling Downs, *Law*, Herb. Mueller, M.

I am indebted to Dr. H. Eichler for notes on the specimens in the herbarium of the Adelaide Botanic Gardens and for assistance in choosing the lectotype. The specimen from 'Reedbeds, near Adelaide', cited by Black, is here excluded as it is fragmentary and its identification is uncertain.

R. sessiliflorus *R. Br. ex DC.* in Syst. Veg. **1**, 302 (1817) ; *R. parviflorus* L. var. *australis* Benth. in Fl. Austral. **1**, 14 (1863), pro parte.

Annual herb with stems 2-35 cm. long, branching from the base, sparingly to \pm densely pilose or nearly glabrous. Early leaves, subreniform palmate, with 3-5 \pm blunt teeth, later leaves palmatisect or ternate, 5-20 mm. wide, with the median segment tridentate and the lateral \pm bifid with 3-4 blunt to subacute teeth to each lobe, \pm pilose on both surfaces, petioles 2-5 cm. long, with basal sheaths ciliate and pilose on the back, upper bracts lanceolate or trifid with lanceolate lobes, pilose. Flowers 2-3 mm. diameter, upper subsessile, lower subsessile or shortly pedicellate with fruiting pedicels to 1.5 cm. long. Sepals 3-4 narrowly oblong to elliptic, 1.5-2.5 mm. long, sub-hyaline, pilose on the back, with 1-3 nerves. Petals 1-2, 1.7-2.3 mm. long, ovate- or elliptic-spathulate to linear-spathulate, usually, with a starch containing (?)

yellow) zone occupying the apical third and a semielliptic to rounded-triangular nectary lobe slightly above the middle, nerves 3. Stamens 3–6, usually 3. Carpels 6–15–20. Achenes 1.5–2 mm. long, sub-orbicular to obovate, with a short subacute to acute triangular beak, compressed to sublenticular, with a lateral faces each bearing 7–20–25 prominent conical papillae terminated by a recurved bristle. Receptacle glabrous.

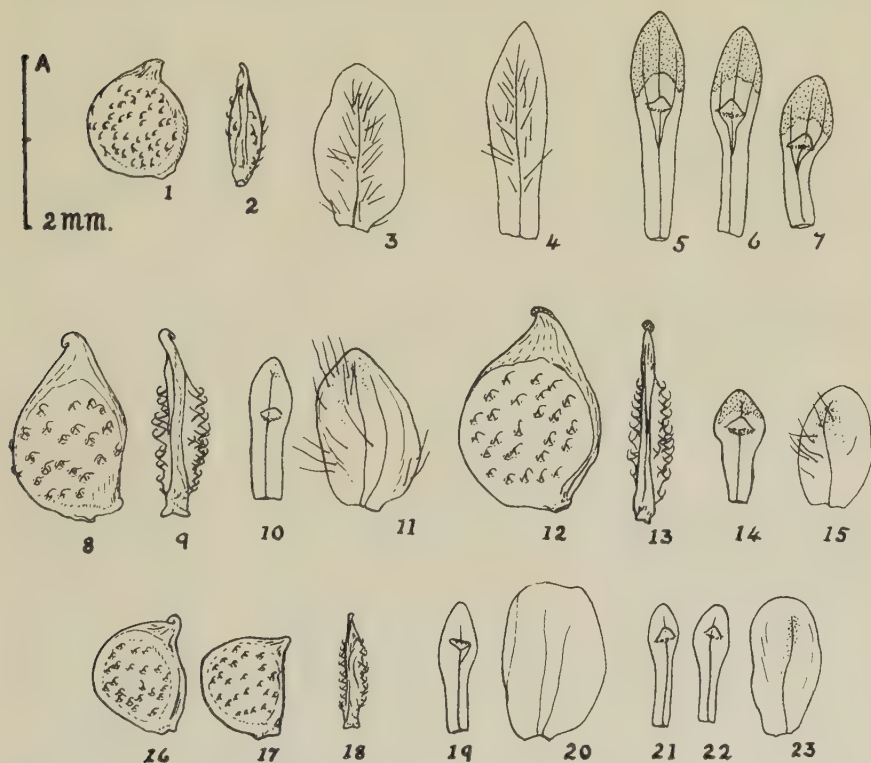


FIG. 5. *Ranunculus sessiliflorus* R. Br. ex DC. 1–15 var. *sessiliflorus*; 16–23 [var. *pilulifer* (Hook.) Melville, from holotype; 1–2, 8–9, 12–13, 16–18, achenes; 3–4, 11, 15, 20, 23, sepals; 5–7, 10, 14, 19, 21–22, petals. 1–7, from Gunn 230/1842, Launceston, Tasmania 27.9.1831; 8–11 from Robertson, Windae Vale, Victoria; 12–15 from Melville 1028; All scale A.

var. **sessiliflorus**. Leaves palmate or palmatifid (Fig. 1, A–B; Fig. 5).

NEW SOUTH WALES : Port Jackson, *R. Brown*, 5251, Holotype, L. ; Paramatta, *Caley* 1805, L. ; Richmond River, *C. Moore*, May 1867, K. ; Abercrombie Caves, *K. Mair*, Sydney Herb. Nos. 17865, 17866, 19.10.1951, K. ; Lakes Knob, *A. Morris* 372, 4.9.1920, B. ; Wards River, *Melville* 701, 31.8.1952, K.

QUEENSLAND : Pine Mountain, Moreton District, *C. T. White*, Aug. 1908, B. ; Wyaga, Goondiwindi District, *C. T. White*, Sept. 1909, B. ; Albert River, S. of Brisbane, *C. E. Hubbard* 3852, 31.8.1930, K. ; Bribie Island, *Eaves*, Herb. Mueller, M.

VICTORIA : Mt. Arapiles, *Melville* 1028, 18.9.1952, K. ; Hawkesdale, *H. B. Williamson*, Sept. 1900, M. ; Windae Vale, *Robertson*, Sept. 1912, K.

TASMANIA : Macquarie Plains, *Gunn* 230, 17.9.1842, K. ; Launceston, *Gunn* 230, 27.9.1831, K.

S. AUSTRALIA : Coast, 40 ml. W. of Port Augusta, *T. P. Richards*, M. ; Gawler Ranges, *Dr. Sullivan*, Herb. Mueller, M.

W. AUSTRALIA : Claremont, *C. Andrews* 4, 1st Coll. 26.9.1902, K. ; Swan River, *Drummond* 127, 1843, K.

var. **pilulifer** (Hook.) Melville, comb. nov. ; *R. pilulifer* Hook. in Ic. Pl., t. 600 (1842) ; *R. pumilio* R. Br. ex DC. var. *pilulifer* (Hook.) Hook f. in Fl. Tasm., 1, 10 (1855), excl. Gunn 230.

Leaves ternate with the lobes cut into linear to lanceolate segments. (Fig. 1, G ; Fig. 5, 16-23).

W. AUSTRALIA : Swan River, *Drummond*. Holotype, K. ; Swan River, *Drummond* 6. K., L. ; Yandanooka, *A. Morrison* 14451, 12.9.1904, K.

VICTORIA : Lowan, Little Desert, *F. M. Reader*, 6.12.1893, M.

NEW SOUTH WALES : Bethunga, 15 mls. S.W. of Cootamundra, *K. Mair*, Sydney Herb. No. 17864, 17.10.1951, K.

The shape of the achenes in *R. sessiliflorus* varies from suborbicular with a small beak (Fig. 5, 1) to narrowly to broadly ovate acute, with a rather prominent beak (Fig. 1, 8, 12). This rostrate form is connected by intermediates to the suborbicular forms and is not clearly differentiated from them by any character or group of characters investigated. When considered separately, their centre and axis of variation overlapped those of more typical specimens of the species. The petals vary in the extent to which the golden, starch-containing zone of the petal is developed ; it may be prominent (Fig. 5, 5-7) or starch may be absent or confined to a few isolated cells (Fig. 5, 10). The type specimen of var. *pilulifer* had the petals free from starch (Fig. 5, 19, 21-22).



FIG. 6. *Ranunculus pumilio* R. Br. ex DC. 1-6, var. *pumilio* ; 7-12, var. *politus* Melville, from holotype ; 1-2, 7-8, achenes ; 3-4, 10, 12, sepals ; 5-6, 9, 11, petals ; 1-6 from Comber 1628. All scale A.

R. pumilio R. Br. ex DC. in Syst. Veg., 1, 271 (1817) ; *R. leptocaulis* Hook. in Journ. Bot., 1, 244 (1834) ; *R. parviflorus* L. var. *australis* Benth. in Fl. Austral., 1, 14 (1863), pro parte.

Annual herb with stems 1-30 cm. long, branching from the base, \pm densely pilose or the upper parts sub-glabrous. Early leaves palmate with about 5 blunt teeth or trifid with 2-3 blunt to acute teeth on each lobe, later leaves 1-3 cm. broad, ternate or palmatisect with the lobes

cut into lanceolate acute to linear segments, \pm densely pilose, rarely sparingly pilose, on both surfaces, petioles 1–7 cm. long, basal sheaths ciliate and pilose on the back, upper bracts linear, pilose. Flowers 2–3 mm. diameter, upper subsessile or with pedicels up to 10 mm. long in fruit, lower with pedicels 3–15 mm. long. Sepals 4–5, narrow to broad elliptic or obovate, 1.5–2.5 mm. long, with 1–3 nerves, subhyaline, with a few hairs to \pm pilose on the back. Petals 2–4, 1.5–2.0 mm. long, with an ovate lobe and narrow claw or ovate-spathulate, starch containing (yellow) zone occupying the apical $\frac{1}{3}$ or $\frac{1}{4}$, nectary lobe semi elliptic or triangular, slightly above the middle, nerves 2–3, the central often forked. Stamens 4–5–6. Carpels 10–20. Achenes 1.5–2 mm. long, suborbicular, with a very short obtuse to subacute triangular beak, compressed, lenticular with the lateral faces completely covered with about 50 curved bristles set on minute papillae. Receptacle glabrous.

var. **pumilio**. Sepals usually 5, lateral faces of achenes hairy (Fig. 6, 1–6).

TASMANIA : In ascensu Montis Tabularis versus flumen Derwent, *R. Brown* 5257, marmai, 1804, Holotype, L. ; sine loc., *Gunn* 230, 1833, Holotype of *R. leptocaulis* Hook., K. ; Circular Head, *Gunn* 230, 24.11.1837, K. ; Woolnorth, *Gunn* 230, 16.10.1837, K. ; Gordon, 30 ml. S. of Hobart, *H. F. Comber* 1628, 16.11.1929, K.

VICTORIA : Mansfield, *C. S. Sutton* 1469, Nov. 1906, K. ; Banks of Yarra River, *F. Mueller*, May 1853, M. ; Bacchus Marsh, *C. Walter*, Jan. 1904, M. ; Nunning Plain, Gippsland, *Melville* 3107, 25.1.1953, K. ; Darlots Ck. near Portland, *Melville* 1658B, K.

NEW SOUTH WALES : Coonamble, *Larmont*, 1883, L.

QUEENSLAND : Jimbour, Darling Downs, *D. Bancroft*, Oct. 1877, B.

W. AUSTRALIA : Swan River, *Drummond* 13, K. ; Porongorup, Herb. Mueller, M.



FIG. 7. *Ranunculus parviflorus* L. 1–2, achenes; 3, petal; 4, sepal; 5, middle cauline-leaf; 6, lower cauline-leaf; from Edmonds 8, Beesands, Devon, England, 26.5.1936, in Herb. Kew. 1–4, scale A; 5–6, scale B.

var. **politus** *Melville*, var. nov. ; a var. *pumilione* acheniis glabris nec tuberculatis nec hispidis et plerumque sepalis 3 differt. Sepals usually 3, lateral faces of the achenes smooth, without either tubercles or hairs. (Fig. 6, 7–12).

VICTORIA : County of Lowan, *F. M. Reader*, 11.9.1898, Holotype, M. ; Swan Hill, *Dr. Gammow*, Herb. Mueller, M. ; N.W. of Lake Albacutya, *C. French*, Sept. 1887, M. ; Wimmera, *Dallachy*, M. ; Donald, *Dr. Curdie*, M. ; Murray River, *F. Mueller*, K.

NEW SOUTH WALES : Murrumbidgee, *G. Day*, Herb. Mueller, M.

The European *R. parviflorus* L. has been introduced on Lord Howe Island and possibly on the mainland of Australia. It most closely resembles *R. sessiliflorus*, but is a more robust plant with palmately lobed or palmatifid, bluntly toothed leaves 1.5–4.0 cm. wide, flowers 4–7 mm. diameter, with ovate shortly clawed petals, about 3 mm. long, with the golden starch containing zone occupying the upper half (about $\frac{3}{4}$ of the lobe) and the three principal nerves all once or twice forked. The upper flowers are all pedicellate, with pedicels 5–15 mm. long in fruit. The achenes are similar to those of *R. sessiliflorus*, but larger, about 3 mm. long. (Fig. 7).

Chromosome Atlas of Flowering Plants.*—This is, in essence, a second and greatly enlarged edition of the "Chromosome Atlas of Cultivated Plants" by C. D. Darlington and E. K. Janaki Ammal, published a decade ago. As the change of title indicates, the chromosome numbers (as somatic not gametic numbers) are given for all flowering (or better seed-bearing) plants as recorded up to the date of compilation in the consulted literature, together with some counts at that time unpublished. The format followed is similar to that of the earlier "Atlas". There is every indication that the preparation of the new list has been thoroughly well done. There can be no question of its great importance as a reliable work of reference, not only for cytogeneticists but also for taxonomists, ecologists, and phytogeographers. Taxonomists are only too glad to use cytological data but need to be warned that mere "chromosome number" is only a part of the help cytogenetics can give to improving plant classification. Size, structure, and behaviour of chromosomes may be even more important. It follows that, as far as possible, taxonomists should consult the original papers to which references are given in the "Atlas" and which are relevant to any particular piece of taxonomic research.

Some of the remarks in the short preface whet one's appetite. It is stated that chromosome numbers "have now been studied in some fifty thousand flowering plants belonging to nearly twenty thousand species". That is to say the chromosome number is recorded for less than one species in ten of known species of seed-bearing plants. Nevertheless, this is a fine achievement in a relatively short time. Obviously, the major gap is in tropical floras. It is claimed that the principle that woody plants are immensely stable in chromosome numbers while ephemerals are in varying degrees unstable can by comparison of the numbers clarify "the origins of living species and the foundations of ecological genetics". One would welcome a detailed account of this. Another statement, that the present edition of the "Atlas" indicates "the widespread existence with unstable genera of two types of chromosome: the A chromosomes which maintain heredity and the B chromosomes which stimulate variation", tantalizes by its brevity. One may hope for a full and lucid exposition of a distinction which may help to solve many taxonomic problems.

W. B. TURRILL.

* C. D. Darlington and A. P. Wylie, Chromosome Atlas of Flowering Plants, George Allen & Unwin Ltd., London, 1955, pp. 519, 60/- net.

THE GENUS LEICHARDTIA R. BR.

A. A. BULLOCK

At a later date I propose to discuss the typification of the genus *Marsdenia* R. Br. but as a result of examination of the species included in it by Brown himself and by later authors, I am convinced that Brown was justified in describing *Leichardtia*, which he thought to be a monotypic Australian endemic. The generic name commemorates Ludwig Leichhardt, who lost his life during an expedition in the Australian hinterland.

The genus was not maintained by Müller, Bentham, or Schlechter, and it is not mentioned by K. Schumann in the *Pflanzenfamilien*. Among the species already described, I have recognised in the Kew herbarium two from Australia and two from New Caledonia; there may be another undescribed species in Australia and a sixth in New Caledonia. They are plants of warm semi-arid regions, characterized by an urceolate corolla with the tube much longer than the lobes, and linear leaves. *L. ericoides* (Schltr.) Bullock is a small erect shrub with simple or very sparingly branched stems, the remainder are slender scrambling and twining plants.

Leichardtia R. Br. in Sturt, Exped. Central Australia, **2**, Bot. App. 81 (1849), non *Leichardtia** F. Müll. Fragm. **10**, 67 (1876), genus *Asclepiadacearum*.

L. australis R. Br. *l.c.*, holotypus nominis generici.

Marsdenia australis (R. Br.) Druce in Rep. Bot. Exch. Club Brit. Isles **1916**, 634 (1917).

M. leichhardtiana F. Müll. Fragm. **5** (38), 160 (1866); Benth. Fl. Austral. **4**, 341 (1869), saltem partim.

This species appears to be fairly widely distributed in semi-arid tropical and subtropical Australia. One of the undescribed species, differing in its larger follicles and glabrous leaves, was included in it by Bentham. When young, the follicles are fleshy and edible.

L. leptophylla (F. Müll. ex Benth.) Bullock, comb. nov.

Marsdenia leptophylla F. Müll. ex Benth. *l.c.* 340.

Known only from the type collection, made at the sources of the Bardekin River in Queensland, this is a plant of the same habit as *L. australis*, but with much smaller flowers.

L. billardieri (Decne.) Bullock, comb. nov.

Marsdenia billardieri Decne. in DC. Prodr. **8**, 615 (1844); Guillaumin, Cat. Pl. Phan. Nouv.-Caled. in Ann. Mus. Col. Marseille, Sér. 2, **9**, 198 (1911).

An endemic of New Caledonia.

* Genus *Menispermacearum*; the spelling with double "h" is correct, but this can be regarded only as an orthographic variant and the name is therefore an illegitimate later homonym of the deliberately adopted *Leichardtia*.—A.A.B.

L. ericoides (Schltr.) Bullock, comb. nov.

Marsdenia ericoides Schltr. in Engl. Bot. Jahrb. **39**, 246 (1906) ; Guillaumin, l.c.

An endemic of New Caledonia ; a further species (*Herb. Deplanche* 468), from the same area, closely allied to *L. australis*, appears to be undescribed.

The Ferns and Fern Allies of Minnesota.*—Dr. Tryon's book, a modern successor to Rosendahl and Butter's work of 1909, has been read with great enjoyment by the reviewer.

The State of Minnesota is comparatively rich in vascular cryptogams, at least by British standards, and its 92 species, varieties and hybrids are presented to the reader in a particularly attractive manner.

The work is lavishly illustrated with excellent line drawings or photographic silhouettes of every species. Those portraying the stems and cones of *Equisetum*, indeed, are very reminiscent of the classic illustrations of similar subjects in Rabenhorst's *Kryptogamen Flora*.

The silhouettes of the *Isoetes* species are, perhaps, the least satisfactory since they might equally well represent grasses or sedges.

In addition to these illustrations the distribution of every species within the state is indicated on small inset maps.

Although Dr. Tryon has attempted to disarm criticism in his introduction by stating that there may be cases when " authors do not agree on the classification or on the names of the same ferns ", the following observations are presented for his consideration.

The retention of *Polypodium phegopteris* L. within the genus *Thelypteris* (or *Lastrea*) is open to serious challenge. Manton has shown that in British material, *T. palustris* Schott is a sexual species with a somatic chromosome number of 70 whereas *Polypodium phegopteris* L. is apogamous and possesses 90 chromosomes. There seems some justification in segregating this species under *Phegopteris*, more especially as it appears probable that certain tropical species are linked with it.

Cystopteris dickieana Sim, based on a Scottish collection, is apparently regarded as synonymous with *C. fragilis*. Although now known only in cultivation, *C. dickieana* is sufficiently distinguishable on several counts, notably in its spores, to warrant separate status.

Dr. Tryon's book is designed to help the interested student to name the ferns and fern allies found in his native state. This purpose is admirably achieved. An intelligent use of the keys provided supplemented by a wealth of illustrations makes identification surprisingly easy.

It is certain that the work will be extremely useful in the country of its origin and at the same time not unworthy of a place on the shelves of all those who have a genuine interest in vascular cryptogams as a whole.

F. BALLARD.

* The Ferns and Fern Allies of Minnesota by Rolla M. Tryon, Jr. Pp. xx + 166, 207 figs. and 85 maps. Minnesota University Press. (London : Geoffrey Cumberlege). 1954. Price 32/- net.

CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA : LXI.*

Notes on *Philoglossa*.

N. Y. SANDWITH

The small *Calendula*-like genus *Philoglossa*, which is at present placed in the *Heliantheae-Melampodinae* of *Compositae*, has remained monotypic, as *P. peruviana* DC., since its description by De Candolle from material collected near Lima by Dombey and Abadia, but the possibility of the existence of a second, Ecuadorean, species was suggested by Bentham in the *Genera Plantarum*, and this suggestion was repeated by Hoffmann in Engler and Prantl's *Pflanzenfamilien*. Much ambiguity has attached to the description of this genus, and more will be discovered and written about it before its correct position in the family is assessed. For the moment I do not wish to go further than mention an unpublished comment kindly communicated to me by Dr. S. F. Blake, who has for so long been the leading student of this family in North America : that *Philoglossa* should probably be placed in the Subtribe *Liabinae* of the Tribe *Senecioneae*. Apart from technical characters, it certainly suggests, by its frequently auricled leaf-sheaths and its involucre, certain species of the Section *Munnozia* of *Liabum*.

De Candolle, *inter alia*, described the receptacle of *Philoglossa* as flat, with linear-subulate, scabrid, very deciduous scales ; and the achenes as obovate, smooth and without a pappus, but with a minute terminal areole. His original description was repeated, word for word, in 1839 in Delessert's *Icones Selectae Plantarum*, 4, p. 15, and a figure (tab. 33) with analyses was provided by Decaisne, which showed an opened capitulum with a flat receptacle bearing a large number of uniform, equally developed, smooth, epappose and wingless achenes with a minute terminal 'areole', as described by De Candolle, but no receptacle scales.

Bentham considered that the specimens available to him were the same plant as De Candolle's species, but he found that the achenes of the ray florets alone were perfect, those of the disk being smaller and empty, and he referred De Candolle's setaceous, caducous receptacle scales to setae of the pappus of sterile disk-achenes which he found on his material and queried as 2-4 in number for each pappus. On the other hand, he gave his own, new, definition of the receptacle of his plant, which he described as flat, with narrow carinate or concave scales or naked in the centre. Moreover, he described the style of the disk-florets as undivided, whereas Decaisne's analysis had shown a distinctly divided style, a character confirmed by Hoffmann in the *Pflanzenfamilien* and by the present writer both in the description which concludes this paper and on material of *P. peruviana* formerly in Bentham's herbarium. Bentham was evidently working with Mathews 554 and 1396, from Peru, and an opened capitulum of no. 1396 has revealed the few, quite long, pappus awns of the smooth wingless disk-achenes, as described by him, as well as the mature, smooth, wingless and epappose achenes of the ray-florets. But the same capitulum makes it clear that the narrow, carinate or concave receptacle scales reported by him were only the very young enrolled ray-florets.

* Continued from Kew Bulletin, 1955, No. 3, p. 480 (1955).

A considerable number of sheets of this genus have by now accumulated in the Kew Herbarium, and also in the United States National Herbarium where they have been studied by Dr. S. F. Blake, who so kindly placed his notes and drawings at my disposal, and to whom I am most grateful for many suggestions and much helpful advice. It is evident that *Philoglossa* is locally quite common both in Ecuador and Peru, occurring in irrigation fields, on the sides of ditches, in damp woods or deciduous brushwood, and in sandy loam under the protection of rocks and boulders, from 350 up to at least 3000 metres. It seems to be plentiful near Quito, and has even been found in the streets of Loxa. The habit is variable, possibly according to habitat and climate. The specimens seen from Peru, mostly collected at relatively low altitudes in the *lomas* region of the Department of Lima, are obviously behaving as small erect annuals, but the Ecuadorean specimens from the plains of high Andine valleys are more or less procumbent and are rooting at least at the lower nodes, sometimes even forming mats. Material at Kew collected near Quito by Jameson and near Riobamba by Spruce (no. 5774) gave rise to the suggestion that a second species of the genus occurs in Ecuador and, in fact, as Dr. Blake first discovered, similar specimens with a decumbent and rooting habit gathered by Sodiro along streams and in marshy ground in Ecuador were described by Hieronymus as a new species, not of *Philoglossa* which he did not mention, but of *Jaumea*, in the *Helenieae-Jauminiae*, with the suggestion, put as a question, that this new plant*, *Jaumea mimuloides*, might better be treated as a new genus, *Jaumeopsis* (see Engl. Bot. Jahrb. **29**, 52, ann. 1900). The latter cannot be regarded as validly published as a name for a genus, although a year later (*loc. cit.*, **28**, 619, ann. 1901) Hieronymus listed *Lehmann* 132, from the Andes of Quito, as *Jaumeopsis mimuloides* Hieron., with the reference to the description of his *Jaumea mimuloides* (but without mention of the latter binomial). At the same time he described a new variety, *Jaumeopsis mimuloides* Hieron. var. *subintegrifolia* Hieron., based on *Bang* 896, from Songo, Bolivia. This collection, represented both at Kew and the British Museum, has a distinctive facies on account of the subentire, denticulate, elliptic leaves which are obtuse or rounded, and mucronate, at the apex. Another Bolivian collection at Kew, *R. Pearce*, from Calcan, Nov. 1864, agrees with *Bang*'s specimens. Like those from Ecuador, the Bolivian plants are rooting at the lower nodes, and it is rather strange that no similar specimens seem yet to have been gathered on the intervening Andes of Peru.

Finally, there is at Kew a single poor specimen of this genus from Southern Colombia. It was collected by E. André, no. 3078, in May, 1876, on the east Andes of Pasto, at Laguna Cocha, and shows the tendency to root at the nodes. It may confidently be referred to the same species as the material from Ecuador and Bolivia which, if regarded as distinct from *P. peruviana*, could bear the epithet *mimuloides* in a new combination.

Dr. Blake and I have found no receptacle scales in any of the capitula we have examined on specimens of *Philoglossa peruviana* (including those referred to *Jaumea mimuloides*). They were not mentioned by Hieronymus,

* Fragments of the type (*Sodiro* 25/1) are preserved in the United States National Herbarium, having been sent there from the Berlin Herbarium some years ago.

who gave careful descriptions of new taxa, and his placing of *J. mimuloides* in *Jaumea* further indicates that he did not find any. We have seen no pappus on any mature achene, but on young achenes a pappus is present, at least in some instances. A few quite long awns are found on the disk achenes of *Mathews* 1396, and a number (10–18) of unequal awn-like squamellae (up to 0.5 mm. long, but mostly very much shorter) are found on those of *Weberbauer* 7687 (from Tumbes), while Dr. Blake has noted pappus awns or squamellae in the heads of several other Peruvian collections. The pappus falls very early and, in Dr. Blake's words, it is evidently vestigial and correspondingly variable. The mature fertile achenes of ray and outer disk florets, as so well described by him, are obovoid or oblong-obovoid, more or less compressed, lenticular or trigonous, glabrous, essentially smooth or tuberculate near the apex or throughout ; a little below the apex they are abruptly contracted into a low cone. Sometimes, a very narrow, pale, submembranous wing is visible on the two angles of the achene, especially towards the base.

I suspect myself that all the material of *Philoglossa* collected hitherto, with the sole exception of *Sandeman* 4230, is most prudently referred for the present to a single species varying a good deal in its method of growth, in the development of the pseudo-stipular sheath at the base of the petiole (this is often more or less conspicuously "auricled" at the apex and is much more evident at the upper nodes of the plants which creep), in the size, shape and tothing of the leaves, and in the quantity and direction of the indumentum (whether spreading-villous or adpressed-ascending). The Peruvian specimens from the *lomas* region, several of which are noted as growing under the protection of boulders, are annual ascending or erect plants with spreading hairs, not rooting at the lower nodes, just as in the original description and Decaisne's figure of *P. peruviana* (and Dr. Blake tells me that De Candolle's type specimen, of which he has seen a photograph, is definitely this characteristic Peruvian form). *Mathews* 1396, said to be from Chachapoyas, has spreading hairs and shows clear evidence of rooting along the basal portion of one of the lower branches, but this rooting is obviously not normal but is merely a reaction of the plant to damage it has received, since its base has been bent and deformed by trampling or some similar agency. The rooting specimens from the other countries show a tendency to a weaker and more adpressed, as well as a villous, indumentum or even to glabrescence of the stems and peduncles. It remains to be proved whether rooting can take place in the Peruvian form as opportunity offers, or whether it can always be distinguished from the other specimens by its habit, by the weaker development of the pseudostipular sheaths which fail to present the funnel-like appearance so often (but not always) evident at the upper nodes of the rooting form, and by the tendency to produce a cluster of several short-peduncled heads at the apex of the branches. If its specific independence from the rooting plants is established, the status of *Weberbauer* 7687 (from deciduous brushwood in Tumbes, Peru), which does not root at the lower nodes but presents certain peculiarities of its own, e.g., in the shape of the narrow outer phyllaries, may have to be reconsidered.

I have seen the following specimens of the taxon, *P. peruviana*, in the broad sense in which I have maintained it for the present :

COLOMBIA. Putumayo : Laguna Cocha, E. Andes of Pasto, May 1876, *André* 3078 (K).

ECUADOR. Pichincha : Andes of Quito, *Jameson* 176 (BM), 213 (K), 269 (K) 775 (BM), sine no., June 1859 (K, BM) ; Calicali, 2800 m., Feb. 1880, *Lehmann* 132 (K), a collection misidentified by Klatt as *Sabazia humilis* Cass., in Engl. Bot. Jahrb. **8**, 42 (1887). Chimborazo : Riobamba, Nov. 1858, *Spruce* 5774 (K, BM), July 1913, *L. Mille* 581 (K). Cañar : Azogues, 3000 m., June 1939, *E. K. Balls* 7120 (K). Azuay : Rio Matadero, W. of Cuenca, c. 2800 m., March 1945, *W. H. Camp* E. 1919 (K). Loja : Loja, Nov. 1876, *André* 4389 (K). Dr. Blake also reports *G. Firmin* 52 (U.S. Nat. Herb.) and *C. W. Penland* 936 (U.S. Nat. Arboretum Herb.) from the province of Pichincha, *Rose et al.* 22833 (U.S. Nat. Herb.) from Cuenca, and *Rose et al.* 23284 (U.S. Nat. Herb.) from Loja.

PERU. Tumbes : mountains S.E. of Hacienda La Choza, 900–1000 m., Feb. 1927, *Weberbauer* 7687 (K, BM). Amazonas : Chachapoyas, *Mathews* 1396 (K). Lima : *Mathews* 554 (K), *Univ. Calif. 2nd Exped.* 9250, 9297, 9306 (all K). Dr. Blake reports the following further collections from the dept. of Lima : *Weberbauer* 5694, *Macbride* 5919, 5957, *Ferreira* 2437, 4022, *Mexia* 04030 [sic], *Soukup* 2893, *Verne Grant* 7490, *Univ. Calif. 2nd Exped.* 11405, 15664. These collections are in the United States National Herbarium, with the exception of the two last mentioned and *Mexia* 04030, in the United States National Arboretum Herbarium.

BOLIVIA : La Paz : Songo, 1890, *Bang* 896 (type collection of *Jaumeopsis mimuloides* (Hieron.) Hieron. var. *subintegrifolia* Hieron., K, BM), a collection listed as "*Stemodontia* (*Wedelia*)—(?)" by Rusby, in Mem. Torrey Bot. Club, **3**, 59 (1893). Callcan, Nov. 1864, *Pearce* (K).

The late Christopher Sandeman's Peruvian specimen of *Philoglossa*, collected at a high altitude in the northern department of Cajamarca, is a very much branched, hairy plant with small leaves, closely resembling *André* 4389 which was gathered in Loja "dans les rues", but showing no tendency to creep by rooting at the lower nodes. I have decided to describe it as a distinct species because of the very interesting character of the conspicuously 2–4-winged achenes, of which the mature, outer ones become pectinate-fimbriate on their margins with the remains of the torn wings, while at the same time the inner disk-achenes either have large and conspicuous untorn wings or are minute and abortive. Further collections or field-studies may perhaps show that there are intermediate stages between plants of *Philoglossa* with wingless or nearly wingless achenes and the extreme form which I am describing : if so, we may have to recognize a single polymorphic species, *P. peruviana*. I was unable to find any receptacle scales in any of the heads of Mr. Sandeman's plant, nor did I find a vestige of pappus. The description is as follows :

Philoglossa pterocarpa, sp. nov. ; a *P. peruviana* DC. achaeniis praecipue disci conspicue 2–4-alatis valde distincta, praeterea ob superficiei achaeniorum muricato-tuberculatas notabilis.

Herba annua decumbens (inferne forsitan nonnunquam radicans ?), e summa radice fibrosa pluriramosa, ramis ipsis iteratim opposite ramosis, ubique subsetoso-pilosa pilis e basi tuberculiformi ortis ; rami primarii ad 15 cm. longi, flexuosi, purpurascens vel brunnei, costis sulcisque conspicuis angulati, pilis satis sparsis plerumque ascendentibus. *Folia* opposita, lanceolata, elliptico-lanceolata vel elliptica, in apicem acutum subacuminatim attenuata, basi cuneata acuta vel obtusa, 1.5–2.8 cm. longa, 0.5–1.2 cm. lata, tenuia, integra sed marginibus denticulata, subtus pallidiora, e basi 3–5-nervia, utrinque satis dense subadpresse subsetoso-pilosa ; petiolus 3–5 mm. longus, basi in vaginam inconspicuam plus minusve dilatatus. *Capitula* pedunculis 1.5–6.5 cm. longis, plane evoluta circiter 1.5 cm. diametro, flosculis laete aurantiacis. *Involucrum* cam-

panulato-turbinatum, 8 mm. altum, circiter 1.2 cm. latum ; bractae 3-4-seriatae, circiter 26-29 ; serierum exteriorum virides, extimae lanceolatae 4.5 mm. longae basi 1.5 mm. latae, interiores latiores, omnes dimidio inferiore pallide superiore saturate virides apice calloso-nigrescenti-virides, dorso marginibusque crebre praecipue dimidio superiore pilosae pilis basi tuberculatis, 5-nerves ; serierum interiorum anguste elliptico-oblongae vel oblongae, attenuato-acuminatae ac apice subpungentes, 6.5-7.3 mm. longae, 1.2-2 mm. latae, omnino scariosae viridi-stramineae, 7-nerves vel intimae angustiores 3-4-nerves, dimidio superiore sparse ciliatae ceterum glabrae. *Corollae radii* circiter 29-43, plus minusve biseriatae, 7.5-8.5 mm. longae, basin versus tubuloso-involutae atque pilosae, parte omnino tubulosa 1 mm. longa circiter 0.3 mm. lata, lamina ligulae plana anguste elliptico-oblonga 1.7 mm. lata glabra apice tridentata ; stylus totus 4.5-5 mm. longus, ramis filiformibus circiter 2.5 mm. longis. *Corollae disci* circiter 33, anguste elliptico-oblongae, supra partem tubi basalem constrictae, tubi parte basali 0.5 mm. longa dense pilosa pilis longis multicellularibus papilliformibus, parte superiore ampliata ("fauce" corollae) 1 mm. longa, lobis anguste deltoideo-lanceolatis 2-2.3 mm. longis apice crista dorsali setarum paucarum rigidarum dentiformium praeditis ; staminum filamenta 0.5-0.6 mm. longa, glabra ; antherae 2-2.5 mm. longae, basi sagittatae oculis ipsis basi obtusis exappendiculatis ecaudatis, apice super oculis appendice brevi deltoidea praeditae ; stylus 3.5-4.5 mm. longus, pubescens, in corollis exterioribus antheras longe superans in interioribus tantum aequans, lobis brevissimis vix 0.3 mm. longis obtusis exappendiculatis ; achaenia juvenilia velut ea radii laevia, glabra, subalata, epapposa sed coronula minuta obscura praedita. *Receptaculum* breviter late conico-elevatum, laeve vel costato-rugosulum, basibus achaeniorum tuberculatum ; paleae nullae visae. *Achaenia* obovoidea, biconvexa subcompressa vel trigona ; exteriora (ut videtur, radii) plane maturescentia 1.5-2 mm. longa 1.2 mm. lata superficiebus passim muricato-tuberculatis praeterea cum reliquiis alarum pectinato-laceratis conspicue marginata ; interiora (disci) alia simul plane evoluta haud matura sed haudquaquam vacua circiter 2 mm. longa, superficiebus plus minusve muricato-tuberculatis, praeterea conspicue late 2-4-alata alis siccitate pallide brunneis 2.75 mm. longis 1 mm. vel paulo ultra latis marginibus mox plus minusve sinuato-laceratis apice ultra achaenii apicem ita provectis ut sinum profundum praebeant, alia simul (interiora) plane imperfecta minuta laevia compressa anguste bialata ; pappus nullus visus.

PERU. Dept. Cajamarca : Llama, Cutervo, 8000 ft., July 1943, *Christopher Sandeman* 4230 (type in Kew Herb., dupl. in Oxford Univ. Herb.). "Herb with small brilliant orange flowers and acuminate opposite leaves, in full exposure".

The outer florets of the disk bear exerted styles far exceeding the anthers, whereas the styles of the inner florets are concealed by them, and presumably it is these inner florets which bear the wholly abortive achenes mentioned in the description.

CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA :

LXII*.

Spruce's "*Bauná*" plant from the Amazons.

N. Y. SANDWITH

In his "Journal of a Voyage up the Amazon and Rio Negro", extracts from which ran through volumes of Sir William Hooker's "Journal of Botany and Kew Garden Miscellany", Richard Spruce gave an account of a plant with large edible roots like enormous turnips which were grated by the Indians for *farinha* in the same way as the roots of *mandioca*. He saw these roots lying near an Indian house on a *campo* by the small Rio Janauari, on the south side of the Rio Negro, which he visited from Barra (Manáus) at the end of January, 1851 (the passage occurs in vol. 5, pp. 210-212 (1853) and was partly reproduced in Wallace's edition (1908) of Spruce's "Notes of a Botanist on the Amazon and Andes", vol. 1, pp. 215-217). Spruce was told that the first Indians to use this root were the Purupurús, of the great Rio Purús, who called it *Bauná*, and he added that it was known also to the Múra Indians by the name of *Maihão*, and to the Tapuya Indians as *Maniacca-acú*, "Great Mandioca". He was taken to see the *Bauná* plant, which was growing in good quantity in forest on the south side of the Janauari, and found that it was a woody twiner (*sipó*). There were no flowers or fruits, but Spruce had little doubt that the branchlets and leaves, of which he gave a short description, belonged to the *Menispermaceae*. He added, "This species gives the most tapioca, but there is another very similar one with leaves of equal dimensions, but equal-sided, with a few scattered minute hairs (some stellate) on upper surface, and beneath densely stellato-pubescent.—I saw specimens of this also."

In a letter to Hooker sent from Barra do Rio Negro (Manáus) on February 23rd, 1851, Spruce mentions the "new edible" he has found among the Indians and which he calls "the root of a woody *Menispermaceae*, in shape almost like a turnip and of immense size—one that I saw weighed 48 lbs.—and from this they make *farinha* and tapioca. I have got a fine root for you, with specimens of *farinha* and tapioca." In a further letter, dated April 7th, 1851, he writes to Hooker, "I am sending down to Pará a small case containing 3 roots of the *Bauná* mentioned in my last letter. The stem, leaves, *farinha* and tapioca will be sent shortly, along with several other things I have for your Museum"; and again, on April 26th, when dispatching a "Ward's Case", he writes "I got (at twice) a dozen plants of the *Bauná*, but only two of them have grown—they are in the case, and I shall be glad to hear of their reaching you alive."

In the "Inwards Book" for 1848-1858 it is recorded that the Case arrived at Kew on August 4th. In it, numbered item no. 15 of the Living Plants, were 2 plants of *Bauná*, "1 alive", and 2 roots of it, one of which, according to Spruce's request, was to be sent to the British Museum, while the other was to be kept for the "Garden Museum" at Kew.

The Museum Entry Book records, under entry no. 233 of the year 1851, the arrival of Spruce's samples : no. 80, *Bauná*, 2 roots, *farinha* and

* Continued from *Kew Bulletin*, p. 293.

tapioca prepared from root, leaves; and no. 80*, *Bauná rána*, leaves only. The nos. 80 and 80* refer to a special numbering, independent of the main herbarium collections which went to Bentham, of specimens packed separately and sent to Sir William Hooker as "a consignment of botanical objects communicated to the Kew Museum, from the Amazon River, in 1851." The items of this consignment are listed, with details, in the same volume 5 of Hooker's *Kew Journal of Botany*, nos. 80 and 80* appearing on p. 241. The 2 roots, and 2 jars with samples of the *farinha* and tapioca, all of Spruce's item no. 80, have been kept ever since then among the Museum material of the *Menispermaceae*.† Of the 2 roots it is recorded that they "cannot be identified in Herb., R.J., 1899", and that they were taken out of spirit in April, 1934. They are top-shaped tubers, of different size, the larger being about 8 inches across and 5 inches high, and therefore small examples, since Spruce described the roots of *Bauná* as 1–2 ft. in diameter by about 10 inches in depth.

The Kew Herbarium has 2 sheets (formerly in Sir William Hooker's Herbarium) of Spruce's collection of the branchlets and leaves of the two kinds of *Bauná*, the two specimens being labelled by him respectively "80. Leaves of Bauná" and "80* *Bauná* (2d. qualy.)". I found them recently in a cover of undetermined sheets placed at the end of the Dicotyledons. The only identification suggested on the sheets is "*Menispermaceae*?", and the specimens had been rightly rejected from the covers of this family. I should now identify both specimens with ***Humirianthera rupestris* Ducke**, a member of the *Icacinales*, which has been collected in the Brazilian States of Pará and Amazonas, one of its localities being near Manáus. Although these two kinds of *Bauná* were recognized by the Indians, and the leaves were regarded as distinct by Spruce, I do not believe that the differences found in the latter represent more than slight variations, chiefly in the quantity of the indumentum. It is the material of no. 80*, *Bauná-rána*, which comes nearest to the Kew sheet of *Herb. Jard. Bot. Rio de Janeiro* 25228 (coll. Ducke), from Manáus, a collection identified by Ducke himself as *H. rupestris*. And this material itself is not uniform, a single detached leaf being densely stellate-pubescent all over the lower surface (as in Spruce's description), while this pubescence is only scattered over the corresponding surfaces of the leaves attached to the branchlet. The branchlets and petioles of both 80 and 80* have the characteristic rusty-red indumentum of those of *H. rupestris*.

Humirianthera rupestris was recently dealt with in a revision of the small genus *Humirianthera* by R. A. Howard, see *Journ. Arnold Arb.* **23**, 75–76 (1942). Its vernacular names are recorded as *Mandioca-assu* (teste Le Cointe), *Mandiocassu* and *Maira* (teste Ducke), *Mandiocassu* meaning "Great Mandioca". Le Cointe, "A Amazonia Brasileira", vol. **3**, 259 (1934), described the root of *Mandioca-Assú*, *H. rupestris* Ducke, as an enormous starchy tuberculum like that of the related species *H. duckei* Huber (the correct name of which is *H. ampla* (Miers) Baehni). His work is a dictionary of the Economic Trees and Plants of the Amazons, but he does not mention *Bauná*, perhaps because he had not consulted Spruce's writings: in any case, Spruce's name does not appear in the list

† And in Wallace's *Glossary of Native Names*, at the end of vol. 2 of his edition of Spruce's "Notes", *Bauná* is referred (p. 519) to the "root of a climber (*Menispermaceae*)".

of the principal works consulted which is found at the beginning of Le Cointe's third volume. *Bauná* is also omitted from A. J. Sampaio's "Nomes vulgares de Plantas da Amazonia", in Bol. Mus. Nac. Rio, **10** (1934).

Spruce describes the disastrous effects of eating *farinha* prepared from the *Bauná* plant without repeated washings of the grated tuber. On the other hand, "when properly prepared, the *farinha* of *Bauná* is scarcely distinguishable from that of *mandioca* ; for three days I lived solely upon *Bauná* and milk (with the exception of once eating a bit of broiled fish), and found it wholesome and nutritious."

If there were further examples of Spruce's two gatherings of the branchlets and leaves, for instance, in Bentham's Herbarium, I have been unable to trace them. It is perhaps worth noting that Spruce at first thought that the *Bauná* plant, apart from its root, was very like the fruiting material of his no. 1227, from Manáus. The resemblance, however, was superficial, and mainly in habit and leaf-shape and venation, since no. 1227 is a *Coccoloba* (*C. paraënsis* Meissn.), in *Polygonaceae*, as Spruce himself later realised.

Garden Spice and Wild Pot Herbs.*—This book savours of old fashioned herbals in its picturesque wood cuts, ample margins, and large print. It is no surprise to learn that the artist, Elfriede Abbe, was responsible for the design of the book as well as for its illustrations.

The authors have endeavoured to provide accurate (if brief) botanical descriptions and up-to-date names for their selection of herbs. English, French, German and Italian names are also given when applicable.

Descriptions of cultivated herbs together with readable accounts of their present day uses occupy most of the book. Wild Pot-Herbs are allotted only 33 pages, and some of the plants in this section might equally well be termed cultivated ; chicory and watercress, for example.

A useful chapter entitled Treatment of the Herbs gives information about propagation, hardiness, seed germination, harvesting, drying, and storing.

Although written and published in America, most of the information provided in this book will interest British readers. It is not a comprehensive work, and its opulent appearance suggests that it may be considered primarily as a "gift-book". Most of the commoner culinary and cottage-garden herbs are included, however ; together with a few unusual species, such as the Korean Mint, *Agastache rugosa* Kuntze, which will catch the eye of the reader who is no longer a novice in herbal lore.

S. G. HARRISON.

*Garden Spice and Wild Pot-Herbs. By Walter Conrad Muenscher & Myron Arthur Rice. With illustrations cut on wood by Elfriede Abbe. 1955, pp. 211. Ithaca—New York : Cornell University Press. Price \$5.75.

THE ROXBURGH FLORA INDICA DRAWINGS AT KEW.

J. R. SEALY

"Dr. William Roxburgh was the first to describe fully, accurately, and reduce to the form of a Flora, according to the Linnean system, the riches of the East But not only did Dr. Roxburgh describe the plants he observed, but he had at the same time splendidly coloured drawings made of most of them." This reference to the existence of drawings illustrative of Roxburgh's *Flora Indica* was made in 1834 by Robert Wight and G. A. Walker-Arnott in the preface to their *Prodromus Florae Peninsulae Indiae Orientalis*, pp. xiii and xiv, and though the drawings were mentioned during subsequent years in various botanical works* their existence seems little known now-a-days, and very few botanists appear to be aware that a very fine set exists in the Library of the Royal Botanic Gardens, Kew.

William Roxburgh (1751–1815) went to India in 1776 in the service of the Honourable East India Company, and, apart from a twelvemonth at the Cape of Good Hope in 1798–9 and a sojourn in Britain during the years 1805–8, he served in India until 1813, being stationed first in Madras, and then, from 1793 onwards, at Calcutta, where he was Superintendent of the Botanic Garden. Soon after his arrival in India he began making descriptions of the native plants, and throughout his career he continued methodically describing all the plants that were available to him. At the same time that he wrote his description, he nearly always had a life-size painting of the plant (or specimen thereof) made by a native artist. In all he described about 2,600 species and had paintings made of more than 2,500 of them.

A selection of three hundred of Roxburgh's drawings and descriptions were published as "*Plants of the Coast of Coromandel*" under the auspices of the Court of Directors of the East India Company, to whom Roxburgh sent copies of his MSS. and drawings at intervals from 1790 onwards. The publication was under the direction of Sir Joseph Banks and comprised three volumes, each issued in four parts: the first part appeared in 1795 and the last twenty-five years later.† About four hundred of the plates in Wight's *Icones Plantarum Indiae Orientalis* (1838–53) were copied from Roxburgh drawings, and are marked "*Roxburghianae*"; a few duplicate the Coast of Coromandel plates, but the majority are different. Thus less than 700 of the total of over 2,500 drawings, which Roxburgh had made, have been reproduced.

Part of Roxburgh's MS. of his *Flora Indica*, edited by William Carey, was published posthumously, along with additions by Nathaniel Wallich,

* For example, Hooker f. & Thomson, *Flora Indica*, 65 (1855); C. B. Clarke's preface, p. v, to his reprint of Roxburgh's *Flora Indica* (1874); De Candolle, *Phytographie*, 445 (1880); and in Sir George King's "*Brief Memoir of William Roxburgh*" (*Ann. Roy. Bot. Gard. Calcutta*, 5, 8: 1895).

† According to W. T. Stearn (*Fl. Males. ser. 1*, 4, Part 3, p. ccx) the dates of publication were:

Vol. I. Part 1, May 1795	Vol. II. Part 1, May 1799
" " 2, Nov. 1795	" " 2, May 1800
" " 3, Aug. 1796	" " 3, April 1802
" " 4, before Sept. 1798	" " 4, May 1805
Vol. III. Part 1, July 1811	Vol. III. Part 3 { Feb. or
" " 2, May 1815	" " 4 { Mar. 1820

under the title *Flora Indica* ; two volumes were issued, vol. I in 1820 and vol. II in 1824. In 1832 the whole of Roxburgh's MS., edited by Carey, was published in three volumes, without any additions. The copy used for both publications was one which Roxburgh had allowed Dr. Carey to have made during what proved to be the last months of his (Roxburgh's) service in India, and Carey records (*Fl. Ind.* **1**, 4 : 1820) that the last part of the manuscript was returned to Roxburgh when the latter was actually on board the ship which was to take him to the Cape of Good Hope. Roxburgh's health had broken down during the hot season of 1813, and he undertook a voyage to the Cape to recuperate. His health did not improve, and he went on from the Cape to St. Helena. He arrived there on 7 June 1813 and remained until February 1814, when he sailed for England (Prain in *Ann. Roy. Bot. Gard. Calcutta*, **10**, II, p. xxi, xxii : 1905). After his arrival he seems to have taken up the task of preparing his *Flora Indica* MS. for the press, but his health failed and he died in Edinburgh on 18 February 1815.

The increasing appreciation of the importance of Roxburgh's work to the student of asiatic botany had led to many enquiries being made concerning the location of the specimens from which his species were described, for although Roxburgh's descriptions are mostly very accurate, they are not always sufficient for certain identification of his plants, especially, as is sometimes the case, when the published account is much abbreviated from that in the MS. Roxburgh specimens are to be found in various herbaria. One of the largest collections is in the Delessert Herbarium at Geneva. This was originally part of A. B. Lambert's Botanical Museum and was purchased by Baron Delessert's agent for £34 at the sale of that Museum in 1842, when it was catalogued as "ROXBURGH'S HERBARIUM, an immense Collection of Plants of the Indian Archipelago, and Continental India, South Africa, &c. from 2000 to 2250 *plants*, with the large Cabinet containing them."

The wording might suggest that it was Roxburgh's own herbarium, but this is at variance with the statement by David Don in his account of Lambert's Herbarium (Lambert, *Descrip. Genus Pinus*, **2**, Appendix, p. 29 : 1824), which reads :

"Dr. Roxburgh enriched this Herbarium with numerous large collections, made in continental India, and in Banda, Amboyna, and other islands of the Indian Archipelago. These amounted to several thousand species ; and among them were several species of the *Nutmeg*. Dr. Roxburgh likewise sent all the specimens and seeds collected by him at the Cape of Good Hope, where he resided a twelve-month."

From this it would appear that Lambert received specimens distributed by Roxburgh, as did others, e.g. Sir Joseph Banks, whose collections now form part of the British Museum herbarium, where there are yet further Roxburgh specimens from the Shuttleworth herbarium (*Hist. Coll. Nat. Hist. Dep. Brit. Mus.* **1**, 178 : 1904). The "authentic collection of Roxburgh plants" which J. D. Hooker and T. Thomson record (*Fl. Ind.* 65 : 1855) as being in the possession of the Linnean Society of London, was located in Brussels by the late Dr. E. D. Merrill, who prepared, and distributed to a number of herbaria, an alphabetical list of the species represented. These specimens, 1376 in all according to the accession list,

had been purchased at the Linnean Society's sale in 1863 for £10 by Martius, whose herbarium was eventually purchased for the Brussels Botanic Garden by the King of Belgium. According to Gage (Hist. Linn. Soc. London, 125 : 1938), the Roxburgh herbarium comprised "a large collection of Indian and Cape plants" and was presented to the Linnean Society "by William Roxburgh previous to 1815."

The Fielding Herbarium at Oxford contains "a large number of plants from India collected by Roxburgh" (Acc. Herb. Univ. Oxford, 15 : 1897), while the Liverpool Museums possess "Very many plants obtained by Roxburgh . . . forwarded to Liverpool through the kindness of Dr. Carey" (Handb. & Guide Herb. Coll. Public Mus. Liverpool, 44 : 1935). Roxburgh specimens are also in the Edinburgh Herbarium, while De Candolle records (DC. Phytogr. 444 : 1880) that he had 300 in his herbarium. Finally there are Roxburgh specimens at Kew, received in the Hooker, Rottler, and Forsyth herbaria, while the "Wallich Herbarium" (more properly the Honourable East India Company's Herbarium) contains the small Roxburgh collection which Wallich says ("Catalogue", p. 60) did not contain any duplicates for distribution. A list of the Roxburgh specimens in the Wallich Herbarium, compiled from the Wallich "Catalogue", was incorporated by Dr. Merrill in his list of the Brussels specimens, and was distributed by him to various herbaria with other data concerning Roxburgh plants. Dr. Merrill was primarily interested in the Malaysian plants described by Roxburgh, and a list of these, with references to literature and the provenance of the species, forms the major part of his MSS.

Roxburgh distributed specimens freely, but does not appear to have kept a set for himself and it would seem that nowhere is there a complete set of his plants whose identity with species described by him is beyond question—Lambert, for example, had all the labels of his specimens rewritten and discarded the originals. Moreover, Roxburgh specimens are often poor and scrappy, and it is not always easy, especially in critical genera, to be *certain* which Roxburgh species they represent.

There are, however, the Roxburgh drawings. According to C. B. Clarke (Roxb. Fl. Ind. reprint, p. v : 1874) Roxburgh "left at the Calcutta Botanic Garden a set of life-sized coloured drawings, with botanical dissections, of plants 2,542 in number, among which nearly all the Indian species described in his Flora Indica are depicted. By these (of which a duplicate set is preserved in the India House, Westminster) the species in the Flora Indica may be verified." The "duplicate set", which is, in fact, the set which Roxburgh sent home to the East India Company, is now at Kew, and it is of particular value since the drawings can be connected with certainty with Roxburgh's descriptions.

It was Roxburgh's practice to number each description as it was written, and to give the same number to the drawing he had made of the plant described. The drawings at Kew all have Roxburgh's number, and thus can be readily associated with the description in a Roxburgh MS. at Kew where the descriptions are in the original numerical sequence.

This MS., which was presented to Kew in 1872 by Roxburgh's son Col. James Roxburgh (see Kew Report, 1873, p. 9), comprises 3379 foolscap pages bound in three volumes and contains 2579 numbered descriptions,

starting with "No. 1 Terminalia Chebula, Linn." and ending with "2579 Davallia chinensis R." It is written in a good script, and is evidently a fair copy, probably made by a native clerk in India, and corresponds to our modern typescript—the typewriter had not then been invented and "copper-plate" handwriting was the eighteenth century equivalent. This MS. was clearly Roxburgh's personal copy, and there are considerable additions, alterations, and notes in his hand. Roxburgh sent home copies of his descriptions to the East India Company at intervals, and these are now in the Library of the Department of Botany of the British Museum (Natural History) on loan from the India Office Library. They show, as might be expected, that Roxburgh revised his work from time to time, and had new copies made. The MS. at Kew is probably the last and most complete of the copies in the numerical sequence. Also in the library of the British Museum Department of Botany is a small quarto MS. entitled "Index to Dr. Roxburgh's Botanical MSS". This has the names of the plants in alphabetical order, and against them eight columns headed as follows :

"Original number of drawing and description "

"Page of the original description "

"P. of the copy sent to England "

"P. of the corrected copy "

"P. of the old Flora "

"P. of the new Flora "

"P. of Carpology "

"Vol. of Drawings Number in the Volume "

In the left-hand margin, against the generic names, are numbers referring to the "Page in the full Flora". The latter proves to be the British Museum's MS. copy of Roxburgh's *Flora Indica* arranged, as eventually published in 1832, in the Linnean system. It is bound in three volumes, has numerous additions and corrections in Roxburgh's hand, and additions in Robert Brown's writing, while there are MS. notes by the latter bound at the beginning of each volume. It is known that Roxburgh proposed to invoke Robert Brown's assistance in preparing his manuscript for the press after his return to Britain (Carey, *Fl. Ind.* 1, 4 : 1820), and there can be little doubt that this is the copy upon which they were working at Roxburgh's death. It may well be the MS. of which, as mentioned above, Carey was allowed to make the copy which he eventually used for the printed versions. The latter do not include many of the additions and corrections found in the British Museum MS., evidently because they were made after Roxburgh left India and were therefore not available to Carey.

As already stated, the numbered drawings at Kew are those sent home to the Court of Directors of the East India Company. They were sent in batches from time to time over a period of some years.* Most of them

* According to inscriptions on the plates, nos. 1-18 were received on 20 January 1791, nos. 19-44 on 9 June 1791, and nos. 45-100 on 30 November 1791. In the MS. at Kew Roxburgh has noted that nos. 201-300 were despatched from Samulcottah on 31 May 1792 (p. 440), that nos. 301-500 were sent off in 1792-3 (p. 641), and that nos. 501-900 were sent in December 1794 (pp. 642, 1019), while there is a note on plate 1463 that it was sent home in 1803-4. Nos. 2101 to 2150 inclusive were sent from India in 1812, according to a list in the library of the British Museum Department of Botany.

are stamped on the back with the E.I.C. Library stamp, and have a printed slip "Icones Roxburghianae" stuck on the face. Some drawings managed to avoid the E.I.C. stamp, notably all those used for reproduction in "Plants of the Coast of Coromandel"; others noted as unstamped include all the *Quercus* drawings, two of *Ulmus* and one *Juglans*. The drawings are all on folio size sheets, mostly imperial folio, and though usually only one species is depicted on each sheet, sometimes there are two or more. The drawings are almost always natural size, as are the dissections, and, with very few exceptions, they are entirely in colour. Each drawing bears a number which is normally the same as the number of the description of the plant in Roxburgh's manuscript, but the numbering of some of the later drawings (from no. 2400 onwards) are slightly out of step with the MSS., obviously owing to the interpolation of a small number of additional species. This has been indicated in the list given below. On each drawing there is also a name, which may or may not be the same as that in the manuscript at Kew or the one eventually published, for Roxburgh revised his naming during the years, as indeed, his MSS. bear witness. When two or more species were drawn on the same sheet, great care was taken with the numbering, so that there should be no mistake; some of these sheets have been cut up, and the different species mounted separately. On the drawings of 1 to 1008, the number is on the face of the sheet in ink (and sometimes in pencil as well) while the name, and sometimes also the number, is in pencil on the verso, usually in Roxburgh's hand. From 1009 to 1200 the number, in ink, and the name, in pencil, are both on the face of the sheet. From 1201 to the end, both name and number are in ink on the face, in fair script, sometimes Roxburgh's.

All except 171 of the numbered drawings were presented to Kew by the East India Company and doubtless accompanied the "Catalogue of Dr. Roxburgh's Botanical Drawings and Descriptions", which is annotated as received at Kew 17 July 1859.* The Catalogue is marked as "prepared in 1824", and the names of the plants are stated to be "arranged as returned by R. Brown Esqr. from the Banksian Library 1823." Some of the E.I.C. set of drawings were evidently left behind at India House, and these, 171 in number, were eventually sent to Kew, along with other Indian drawings from the India Office library, in 1879 by the Secretary of State for India (Kew Report, 1880, p. 66). These Roxburgh drawings are all originals of plates in the "Plants of the Coast of Coromandel", and are embossed with the Secretary of State for India Library stamp. Evidently the drawings used for the "Plants of the Coast of Coromandel" were kept apart from the rest of the Roxburgh drawings, and became divided; some are still missing. Of the 2579 numbered descriptions in Roxburgh's MSS., 2512 are represented by numbered drawings at Kew. Of the other 67, some may not have been figured, but, as indicated above, some drawings are certainly missing.

In addition to the numbered drawings, there are 150 paintings at Kew which were presented by the British Museum in June 1889, and which,

* It was in July 1859, that Kew received the eleven large wagon loads of specimens (principally Falconer, Griffith & Helfer collections) from the cellars of India House, to which Sir William Hooker referred in his "Report on the Progress and Condition of the Royal Gardens of Kew. From 1853 to 1859", p. 11.

though not specifically marked as Roxburgh drawings, are, certainly for the most part, copies or versions of Roxburgh originals, or even in some cases seem to be the original itself. They bear names and other data derived from Roxburgh's work written in an unknown hand. Two or three bear Roxburgh's MS. number, some are named or annotated in Roxburgh's handwriting, while on a painting of *Vitex alata* he has written "Spare copy was sent home as No. 1463 in 1803-4". These drawings have been trimmed at some time, and not infrequently part of the inscription has been cut off. Their origin remains unknown. It is possible they may have formed part of a set of drawings which Roxburgh had for his own use, but so far there is no direct evidence that he did have a personal set of the paintings.

Besides the set at Kew, and that at Calcutta to which reference has already been made, there are other copies of Roxburgh drawings in existence. For example the British Museum Department of Botany has a large number which originally belonged to Dr. P. Russell (who wrote the preface to Roxburgh, *Plants of the Coast of Coromandel*, and whom Roxburgh succeeded as the East India Company's Botanist) and to Dr. John Fleming (who, like Roxburgh, was one of the group of botanists who worked together in south India for a time in the last quarter of the eighteenth century). Unfortunately none of these drawings have Roxburgh's number, and their identification with plants described by Roxburgh can only be established for certain by comparison with numbered drawings such as those at Kew, or with published plates. The same is true of the 1371 drawings belonging to the India Office Library, which are now on loan to the British Museum. Most of the drawings are copies of Roxburgh's but some are not. They are bound up in fourteen folio volumes entitled "Hindoostan Plants", and originally belonged to the Marquis Wellesley who was Governor-General of India from 1797 to 1805.

Mention must also be made of the 1825 Roxburgh drawings which were discovered in a nobleman's library in Brussels by Louis Piré, and which, it would seem, may have originally belonged to Dr. John Fleming (see Piré in *Bull. Soc. Bot. Belg.* **15**, 8 : 1876 ; *DC. Phytogr.* 444 : 1880).

Finally a reference to the statement by Sir George King in his memoir of Roxburgh (*Ann. Roy. Bot. Gard. Calcutta*, **5**, 8 : 1895) that "Copies of all of these drawings [i.e. those left at Calcutta] were made at the expense of the late Sir W. J. Hooker, and were deposited by him at Kew where they can now be consulted." It is quite true that there are copies at Kew which belonged to Sir William Hooker, but these are pencil or pen and ink sketches of parts of the Roxburgh drawings *made by* Sir William himself. They are mostly on octavo size paper and are bound up in ten octavo volumes. On a blank leaf at the beginning of volume 1 is the following note in pencil by Sir Joseph Hooker : "Copy of the MSS. and drawings of Roxburgh's *Flora Indica* preserved in the India House Leadenhall St., by Sir W. J. Hooker, preparatory to his proposed journey to Ceylon, in about the years 1810-12."

In addition to the *Flora Indica* drawings, there are at Kew paintings bearing the "Icones Roxburghianae" label which do not appear to be

connected in any way with Roxburgh's Flora. Like the Flora Indica drawings they are on folio sheets, have analyses, and are fully coloured, but unlike those drawings the painting is enclosed in a double-rule frame. They comprise two series, one numbered from "1" to "25", the other numbered from "No. 1" to "No. 25", the numbers, like the names, being written in ink on the face of the sheet. These drawings, of which two have not yet been found, are not included in the list below, but are enumerated separately afterwards.

ACKNOWLEDGEMENTS. The Roxburgh drawings at Kew were originally distributed through the Collection of Drawings; we are greatly indebted to Miss M. Whiting for searching through the Collection and extracting them, and also for drawing attention to a number of points of interest concerning them. To the Director of the British Museum (Natural History) and to the Keeper of the Department of Botany I am greatly indebted for the special facilities they so kindly provided in connexion with this work, while my grateful thanks go to Miss P. I. Edwards, Librarian of the Department of Botany, for the interest she has taken in the work and the help she has so freely given. My thanks are also due to Mrs. M. Archer, who is at present working on a catalogue of the drawings in the India Office Library, and who was kind enough to read the MS. of this account of the Roxburgh drawings. Finally I would like to record my appreciation of the help given by my assistant, Mrs. Iris Hitt (née Bewley), especially with the listing of the drawings, and in checking them with Roxburgh's MS. and with the Flora Indica, very necessary but often tedious tasks which we were both glad to finish; for her assistance I have indeed reason to be grateful.

THE FLORA INDICA DRAWINGS AT KEW

The list which follows comprises the names of all the species in Roxburgh's Flora Indica of 1832, together with other Roxburgh names published elsewhere, e.g. in the "Plants of the Coast of Coromandel" (1795-1820); it also includes the cryptogams, which were omitted from the Flora Indica but of which an account, based on a Roxburgh MS., was published by Griffith in the Calcutta Journal of Natural History, 4, 463-520 (1844) and reprinted by C. B. Clarke with his reprint of the Flora Indica (1874). Against each species is entered the volume- and page-number of the Flora Indica (1832) the page-number of Clarke's reprint, and the Roxburgh MS. number (if it had one); unless there is a note to the contrary, there is a numbered drawing of the species at Kew. Not all the species included in Flora Indica are represented by numbered descriptions. Those for which no number is given in the list below are not in the Kew MS. at all, and comparison with the "Index to Dr. Roxburgh's Botanical MSS." at the British Museum Department of Botany (see above p. 300) shows that these species are also without numbers in that document. Drawings have been found of very few of these species. Evidently, when compiling his Flora Indica, Roxburgh added to his numbered species others from other MSS. Points of interest connected with the drawings are noted in the list, and references are given to Roxburgh, Plants of the Coast of Coromandel (Pl. Corom.), and to Wight, Icones Plantarum Peninsulae Indiae Orientalis (Wight Ic.), for

drawings reproduced in those works. The references to Wight have been taken from the MS. list prepared by the late Dr. E. D. Merrill, and distributed by him with his other unpublished data concerning Roxburgh's plants. Finally, the page number in the British Museum copy of Roxburgh's *Flora Indica* MS. is given for each genus, this being taken from the Index to that work, which was prepared by Roxburgh and is in his autograph.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Abroma</i> 1801				
angusta ...	3,156 ;	510 ;	415 ;	also an unnumbered drawing very different from No. 415.
<i>Abrus</i> 1930				
preparatorius ...	3,257 ;	544 ;	1157.	
<i>Acalypha</i> 2422				
amentacea ...	3,676 ;	666 ;	— ;	no drawing.
chinensis ...	3,677 ;	686 ;	2099.	
ciliata ...	3,676 ;	685 ;	271/2.	
conferta ...	3,677 ;	686 ;	2557 ;	No. 2550 on drawing.
cylindrica ...	3,678 ;	686 ;	— ;	no drawing.
Indica ...	3,675 ;	685 ;	271/1.	
pilosa ...	3,676 ;	686 ;	— ;	no drawing.
<i>Acanthus</i> 1632				
ilicifolius ...	3,32 ;	469 ;	966.	
madaraspatisensis ...	3,33 ;	469 ;	— ;	no drawing.
<i>Achras</i> 1022				
Sapota ...	2,181 ;	300 ;	— ;	no drawing.
<i>Achyranthes</i> 519				
alternifolia ...	1,674 ;	226 ;	585 ;	Wight Ic. 732.
aquatica ...	1,673 ;	226 ;	— ;	no drawing.
aspera ...	1,673 ;	226 ;	— ;	no drawing.
diandra ...	1,677 ;	227 ;	1809 ;	Wight Ic. 722.
ferruginea ...	1,675 ;	227 ;	926 ;	Wight Ic. 721.
incana ...	1,671 ;	225 ;	2128.	
lanata ...	1,676 ;	227 ;	928 ;	Wight Ic. 723.
lappacea ...	1,673 ;	226 ;	1374 ;	Wight Ic. 731.
Monsoniae ...	1,673 ;	226 ;	1375 ;	Wight Ic. 725.
nodiflora ...	1,678 ;	228 ;	— ;	no drawing.
prostrata ...	1,674 ;	226 ;	1225 ;	Wight Ic. 733.
scandens ...	1,676 ;	227 ;	927 ;	Wight Ic. 724.
sericea ...	1,675 ;	227 ;	586 ;	Wight Ic. 726.
triandra ...	1,678 ;	227 ;	1033 ;	Wight Ic. 727.
<i>Acorus</i> 989				
Calamus ...	2,169 ;	296 ;	— ;	no drawing.
<i>Acrostichum</i>				
alatum ...	—	749 ;	— ;	no drawing.
emarginatum ...	—	749 ;	1743.	
heterophyllum ...	—	749 ;	— ;	no drawing.
radiatum ...	—	749 ;	695.	
ramentaceum ...	—	749 ;	— ;	no drawing.
sectacoconense ...	—	749 ;	— ;	no drawing.
semipinnatum ...	—	749 ;	— ;	no drawing.
<i>Adansonia</i> 1811				
digitata ...	3,164 ;	513 ;	969 ;	No. 967 on drawing by error.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
Adelia 2622				
castanicaarpa ...	3,848 ;	744 ;	2411.	
cordifolia ...	3,849 ;	744 ;	— ;	no drawing.
nercifolia ...	3,849 ;	744 ;	121.	
Adenanthera 1221				
aculeata ...	2,371 ;	361 ;	49 ;	Pl. Corom. 63 as <i>Prosopis spicigera</i> .
pavonia ...	2,370 ;	360 ;	1427.	
Adiantum				
caudatum ...	—	760 ;	1756.	
microphyllum ...	—	761 ;	— ;	no drawing.
proliferum ...	—	760 ;	— ;	no drawing.
tenerum ...	—	761 ;	— ;	no drawing.
Aegclitis 925				
rotundifolia ...	2,111 ;	278 ;	2470 ;	No. 2468 on drawing.
Aegenetia 1630				
indica ...	3,30 ;	468 ;	338 ;	Pl. Corom. 91.
Aegiceras 1767				
majus ...	3,130 ;	502 ;	1152.	
Aegle 1478				
Marmelos ...	2,579 ;	428 ;	75 ;	Pl. Corom. 143.
Aerides 2191				
ampullaceum ...	3,467 ;	618 ;	2347.	
cornutum ...	3,472 ;	617 ;	2093.	
guttatum ...	3,471 ;	616 ;	1905.	
multiflorum ...	3,475 ;	618 ;	2346 ;	Pl. Corom. 271.
pallidum... ...	3,475 ;	617 ;	2349.	
radiatum ...	3,476 ;	618 ;	2351.	
rostratum ...	3,474 ;	617 ;	2348.	
suaveolens ...	3,473 ;	617 ;	2350.	
Aeschynomene 2030				
aspera ...	3,365 ;	580 ;	298 ;	in Flora Indica as <i>Hedysarum lagenarium</i> ; <i>A. aspera</i> in Kew MS. but <i>A. aquatica</i> on back of plate.
cannabina ...	3,335 ;	570 ;	904 ;	no drawing ; there is an unnumbered drawing under this name.
grandiflora ...	3,331 ;	569 ;	294.	
Indica ...	3,365 ;	581 ;	299 ;	in Flora Indica as <i>Hedysarum neli-teli</i> ; <i>A. indica</i> on the drawing and in the Kew MS.
paludosa ...	3,333 ;	570 ;	973 ;	also an unnumbered drawing which is almost a replica of 973.
procumbens ...	3,337 ;	571 ;	297.	
sesban ...	3,332 ;	569 ;	295.	
spinulosa ...	3,333 ;	570 ;	296.	
uliginosa ...	3,334 ;	570 ;	974.	
Agave 988				
Cantula ...	2,167 ;	296 ;	— ;	no drawing.
Ageratum 2128				
aquaticum ...	3,416 ;	598 ;	677.	
cordifolium ...	3,415 ;	597 ;	1283 ;	drawing named <i>Serratula cordifolia</i> .
Agrostis 354				
coromandeliana ...	1,316 ;	106 ;	820 ;	also an unnumbered drawing different from No. 820.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Agrostis—continued</i>				
diandra ...	1,317 ;	106 ;	822.	
Matrella ...	1,317 ;	106 ;	2425 ;	no drawing.
maxima ...	1,317 ;	106 ;	823.	
tenacissima ...	1,316 ;	106 ;	821.	
<i>Ailanthus</i> 1312				
excelsa ...	2,450 ;	386 ;	136 ;	Pl. Corom. 23.
<i>Aira</i> 367				
filiformis ...	1,326 ;	109 ;	824.	
<i>Ajuga</i> 1593				
disticha ...	3,2 ;	459 ;	302.	
fruticosa ...	3,1 ;	458 ;	1455.	
repens ...	3,3 ;	459 ;	2525 ;	No. 2519 on drawing.
<i>Alangium</i> 1372				
hexapetalum ...	2,503 ;	404 ;	230.	
<i>Aldrovanda</i> 926				
verticillata ...	2,112 ;	278 ;	1129.	
<i>Aleurites</i> 2370				
triloba ...	3,629 ;	670 ;	988.	
<i>Allium</i> 959				
ascalonium ...	2,142 ;	288 ;	1549.	
cepa ...	2,142 ;	287 ;	— ;	no drawing.
Porrum ...	2,141 ;	287 ;	— ;	no drawing.
sativum ...	2,142 ;	287 ;	— ;	no drawing.
tuberosum ...	2,141 ;	287 ;	1050.	
<i>Allophyllus</i> 1091				
lanatus ...	2,263 ;	326 ;	1406 ;	<i>A. lanatus</i> is a mistake for <i>A. ternatus</i> Lour., which is the name in Roxburgh's MS. ; the drawing is named " <i>Allophyllus ornitropioides</i> R."
<i>Alnus</i> 2315				
dioica ...	3,580 ;	653 ;	2378.	
glutinosa ...	3,580 ;	653 ;	— ;	no drawing.
<i>Aloe</i> 988				
perfoliata ...	2,167 ;	296 ;	— ;	no drawing.
<i>Alpinia</i> 65				
Allughas ...	1,62 ;	21 ;	905.	
bracteata ...	1,63 ;	21 ;	2103.	
calcarata ...	1,69 ;	23 ;	1303 ;	drawing named <i>Amomum spicatum</i> Roxb.
Cardamomum ...	1,70 ;	24 ;	1301 ;	Pl. Corom. 226.
Cardamomum medium ...	1,74 ;	25 ;	2161 ;	Pl. Corom. 252 as <i>A. costata</i> .
costata ...	—	—	2161 ;	Pl. Corom. 252.
Galanga ...	1,59 ;	20 ;	1302 ;	drawing named <i>Amomum galanga</i> .
linguiforme ...	1,75 ;	26 ;	2162 ;	Pl. Corom. 276.
malaccensis ...	1,64 ;	22 ;	1762 ;	No. 1765 on drawing.
mutica ...	1,67 ;	23 ;	1929.	
nutans ...	1,65 ;	22 ;	1304 ;	drawing named <i>Amomum nutans</i> .
punicea ...	1,73 ;	25 ;	2007.	
spicata ...	1,70 ;	24 ;	2160.	
<i>Althaea</i> 1832				
rosea ...	3,180 ;	518 ;	— ;	no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
Alyxia 633				
stellata ...	1,699 ;	235 ;	1540 ;	also two unnumbered drawings, one a replica of No. 1540, the other a less advanced version, all are named <i>Rauwolfia pulassaria</i> Roxb.
Amaranthus 2340				
atropurpureus ...	3,608 ;	662 ;	— ;	no drawing.
cruentus ...	3,610 ;	663 ;	— ;	no drawing.
fasciatus ...	3,609 ;	663 ;	447 ;	Wight Ic. 717.
frumentaceus ...	3,609 ;	663 ;	1677 ;	Wight Ic. 720.
gangeticus ...	3,606 ;	662 ;	— ;	no drawing.
hybridus ...	3,609 ;	663 ;	— ;	no drawing.
lanceolatus ...	3,607 ;	662 ;	1676 ;	Wight Ic. 716.
lividus ...	3,605 ;	662 ;	— ;	no drawing.
melancholicus ...	3,608 ;	663 ;	— ;	no drawing.
oleraceus ...	3,605 ;	662 ;	446 ;	Wight Ic. 715.
polygamus ...	3,603 ;	661 ;	444 ;	Wight Ic. 714.
polygonoides ...	3,602 ;	661 ;	443 ;	Wight Ic. 719.
spinosus ...	3,611 ;	663 ;	— ;	no drawing.
tenuifolius ...	3,602 ;	660 ;	1174 ;	Wight Ic. 718.
tricolor ...	3,608 ;	663 ;	— ;	no drawing.
tristis ...	3,604 ;	661 ;	445 ;	Wight Ic. 713.
viridis ...	3,605 ;	661 ;	— ;	no drawing.
Amaryllis 959				
aurea ...	2,141 ;	287 ;	— ;	no drawing.
radiata ...	2,140 ;	287 ;	1131.	
Ambrosinia 2214				
ciliata ...	3,491 ;	623 ;	1087 ;	Pl. Corom. 294 ; Wight Ic. 775.
retrospiralis ...	3,492 ;	623 ;	1292 ;	Wight Ic. 772.
spiralis ...	3,492 ;	623 ;	1654 ;	Wight Ic. 773.
unilocularis ...	3,493 ;	624 ;	245 ;	Wight Ic. 774.
Ammannia 470				
multiflora ...	1,426 ;	143 ;	915.	
nana ...	1,427 ;	143 ;	549.	
octandra ...	1,425 ;	143 ;	625 ;	Pl. Corom. 133.
pentandra ...	1,427 ;	143 ;	548.	
rotundifolia ...	1,425 ;	142 ;	1344.	
vesicatoria ...	1,426 ;	143 ;	35.	
Amomum 42				
aculeatum ...	1,40 ;	14 ;	1761 ;	No. 1763 on drawing.
angustifolium ...	1,39 ;	13 ;	1759 ;	No. 1762 on drawing.
aromaticum ...	1,45 ;	15 ;	2158.	
Cardamomum ...	1,37 ;	13 ;	1508 ;	drawing missing ; Pl. Corom. 227.
dealbatum ...	1,43 ;	15 ;	2102.	
maximum ...	1,41 ;	14 ;	1009.	
roseum ...	1,50 ;	17 ;	502 ;	Pl. Corom. 126 ; in Flora Indica as <i>Zingiber roseum</i> .
sericeum ...	1,46 ;	16 ;	— ;	no drawing.
subulatum ...	1,44 ;	15 ;	2157 ;	drawing missing ; there is a drawing, a copy of the one at Calcutta ; Pl. Corom. 277.
Ammora				
cucullata ...	2,212 ;	310 ;	1826 ;	Pl. Corom. 258 ; in Flora Indica as <i>Andersonia cucullata</i> .
Amygdalus 1369				
communis ...	2,500 ;	403 ;	— ;	no drawing.
cordifolia ...	2,500 ;	403 ;	2263.	
persica ...	2,500 ;	403 ;	— ;	no drawing.

Name and page-no. in Fl. Ind. MS.		Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Amyris 1070				
acuminata	...	2,246 ;	321 ;	1831.
commiphora	...	2,245 ;	320 ;	1053 ; <i>A. agallocha</i> in Kew MS.
gileadensis	...	2,246 ;	321 ;	2481 ; No. 2479 on drawing.
heptaphylla	...	2,248 ;	322 ;	1054.
nana	...	2,249 ;	322 ;	1408.
pentaphylla	...	2,248 ;	321 ;	1551.
punctata	...	2,251 ;	322 ;	937.
simplicifolia	...	2,244 ;	320 ;	2480 ; No. 2478 on drawing.
suffruticosa	...	2,250 ;	322 ;	1409.
Sumatrana	...	2,251 ;	322 ;	— ; no drawing.
Anacardium 1148				
dubium	...	2,313 ;	342 ;	2487 ; No. 2484 on drawing which is uncoloured.
occidentale	...	2,312 ;	342 ;	2055.
Andersonia 1035				
cucullata	...	2,212 ;	310 ;	1826 ; Pl. Corom. 258 as <i>Amoora cucullata</i> .
Rohituka	...	2,213 ;	311 ;	934, 1827 ; No. 934 is inscribed "Novum genus Hexandr." and there is no name in the Kew MS. under this number. Under 1827 in the MS. is a reference to the earlier drawing and description.
Andrachne 2483				
trifoliata	...	3,728 ;	703 ;	1698 ; no drawing.
Andropogon 279				
aciculatus	...	1,262 ;	88 ;	887.
bicolor	...	1,268 ;	90 ;	897.
binatus	...	1,255 ;	85 ;	1935.
Bladhii	...	1,259 ;	87 ;	879.
cernuus	...	1,270 ;	90 ;	— ; no drawing.
conjugatus	...	1,255 ;	85 ;	1936.
contortus	...	1,253 ;	85 ;	874.
fascicularis	...	1,265 ;	89 ;	891.
filiformis	...	1,256 ;	86 ;	1937.
glaber	...	1,267 ;	89 ;	1194 ; also an unnumbered drawing which is almost identical with No. 1194.
Ischaemum	...	1,259 ;	87 ;	2106 ; species appears twice in Flora Indica, same description.
Iwarancusa	...	1,275 ;	92 ;	1094.
lanceolatus	...	1,257 ;	86 ;	2019.
laxus	...	1,271 ;	91 ;	894 ; also an unnumbered drawing which is almost identical with No. 894, but has an extra leaf.
Martini	...	1,277 ;	93 ;	1095 ; also an unnumbered drawing greatly resembling No. 1095.
miliaceus	...	1,272 ;	91 ;	1717.
monandrus	...	1,260 ;	87 ;	875 ; also an unnumbered drawing greatly resembling No. 875.
montanus	...	1,267 ;	90 ;	889, 890 ; also an unnumbered drawing very similar to No. 889.
muricatus	...	1,265 ;	89 ;	893.
parviflorus	...	1,274 ;	92 ;	877.
pertusus	...	1,258 ;	87 ;	880.
polystachyos	...	1,261 ;	87 ;	2020.
pumilus	...	1,273 ;	91 ;	2021.
punctatus	...	1,264 ;	88 ;	892.
saccharatus	...	1,271 ;	91 ;	— ; no drawing.
saccharoides	...	1,264 ;	88 ;	2107.
scandens	...	1,258 ;	86 ;	878.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Andropogon—continued</i>				
<i>Schoenanthus</i> ...	1,274 ;	92 ;	883.	
<i>serratus</i> ...	1,253 ;	85 ;	873 ;	also an unnumbered drawing nearly identical with No. 873.
<i>Sorghum</i> ...	1,269 ;	90 ;	898.	
<i>strictus</i> ...	1,261 ;	87 ;	876 ;	also an unnumbered drawing which shows the base of the plant; this is missing in No. 876, otherwise the drawings are identical.
<i>tenellus</i> ...	1,254 ;	85 ;	1934.	
<i>tridentatus</i> ...	1,257 ;	86 ;	2018.	
<i>tristachyos</i> ...	1,256 ;	86 ;	1938.	
<i>verticillatus</i> ...	1,263 ;	88 ;	888.	
<i>Anethum</i> 915				
<i>Panmori</i> ...	2,94 ;	272 ;	1387 ;	Wight Ic. 570.
<i>Sowa</i> ...	2,96 ;	272 ;	1046.	
<i>trifoliatum</i> ...	2,96 ;	273 ;	— ;	no drawing.
<i>Anneslea</i> 1480				
<i>spinosa</i> ...	2,573 ;	427 ;	1452 ;	Pl. Corom. 244 as <i>Euryale ferox</i> .
<i>Annona</i> 1773				
<i>reticulata</i> ...	2,657 ;	453 ;	2520 ;	No. 2514 on drawing.
<i>squamosa</i> ...	2,657 ;	453 ;	— ;	no drawing.
<i>Anthericum</i> 968				
<i>tuberosum</i> ...	2,149 ;	290 ;	599 ;	Pl. Corom. 138. Also an unnumbered drawing quite different from 599.
<i>uniflorum</i> ...	2,149 ;	290 ;	1820.	
<i>Anthistiria</i> 271				
<i>arundinacea</i> ...	1,251 ;	84 ;	1718.	
<i>ciliata</i> ...	1,247 ;	83 ;	1771.	
<i>Cymbaria</i> ...	1,251 ;	84 ;	886.	
<i>heteroclita</i> ...	1,249 ;	83 ;	1774.	
<i>polystachya</i> ...	1,248 ;	83 ;	1772.	
<i>prostrata</i> ...	1,250 ;	83 ;	885.	
<i>scandens</i> ...	1,248 ;	83 ;	1773.	
<i>Antidesma</i> 2532				
<i>paniculata</i> ...	3,770 ;	718 ;	1297 ;	Wight Ic. 572.
<i>pubescens</i> ...	3,770 ;	717 ;	108 ;	Pl. Corom. 167 ; Wight Ic. 820.
<i>Apium</i> 917				
<i>involutatum</i> *	2,97 ;	273 ;	1388 ;	Wight Ic. 567.
<i>Apluda</i> 365				
<i>aristata</i> ...	1,324 ;	109 ;	884.	
<i>geniculata</i> ...	1,325 ;	109 ;	1939.	
<i>Apocynaceae</i> ...				
	— ;	— ;	2467 ;	no drawing ; “ Apocynaceae from Pegu ” in Kew MSS.
<i>Aponogeton</i> 1032				
<i>echinatum</i> ...	2,210 ;	310 ;	— ;	no drawing.
<i>microphyllum</i> ...	2,211 ;	310 ;	1232.	
<i>monostachyon</i> ...	2,210 ;	309 ;	624 ;	Pl. Corom. 81.
<i>undulatum</i> ...	2,211 ;	310 ;	936.	

* The name *Apium involutatum* was omitted from the Flora Indica by some mistake. It should be inserted (2,97 ; reprint p. 273) above the line beginning “ Annual, glaucous, villous . . . ”

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Aquilaria 1283			
Agallochum ...	2,422 ;	377 ;	1970.
Arachis 1959			
fruticosa ...	3,282 ;	552 ;	1273.
hypogaea ...	3,280 ;	552 ;	1272.
Aralia 921			
digitata ...	2,107 ;	276 ;	1229.
umbraculifera ...	2,108 ;	277 ;	1816.
Arbutus 1271			
herpetica ...	2,412 ;	374 ;	— ; no drawing.
Ardisia 708			
colorata ...	1,581 ;	195 ;	2126.
crenata ...	1,583 ;	196 ;	1125.
divergens ...	1,583 ;	196 ;	— ; no drawing.
glandulosa ...	1,584 ;	196 ;	2442 ; No. 2441 on drawing.
lanceolata ...	1,583 ;	196 ;	2444 ; No. 2443 on drawing which is uncoloured. The name on the drawing and in the Kew MS. is <i>A. lanceolaria</i> .
paniculata ...	1,580 ;	195 ;	2443 ; No. 2442 on drawing.
solanacea ...	1,580 ;	195 ;	193 ; Pl. Corom. 27.
umbellata ...	1,582 ;	196 ;	1538.
villosa ...	1,582 ;	196 ;	— ; no drawing.
Areca 2355			
Catechu ...	3,615 ;	665 ;	449 ; Pl. Corom. 75.
Dicksonii ...	3,617 ;	665 ;	1678.
disticha ...	3,620 ;	667 ;	1679.
gracilis ...	3,619 ;	666 ;	2380.
triandra ...	3,618 ;	666 ;	1995.
Arenaria 1309			
flaccida ...	2,447 ;	385 ;	1141.
Argemone 1428			
mexicana ...	2,572 ;	426 ;	— ; no drawing.
Aristida 392			
depressa ...	1,351 ;	118 ;	857.
Hystrix ...	1,350 ;	118 ;	856.
setacea ...	1,349 ;	117 ;	855.
Aristolochia 2211			
acuminata ...	3,489 ;	622 ;	2548 ; No. 2542 on drawing ; Wight Ic. 771.
bracteata ...	3,490 ;	622 ;	220.
Indica ...	3,489 ;	622 ;	221.
longifolia ...	3,490 ;	622 ;	— ; no drawing.
Artemisia 2131			
caruifolia ...	3,422 ;	599 ;	1639.
elegans ...	3,421 ;	599 ;	1170.
hemisphaerica ...	3,423 ;	600 ;	1285.
Indica ...	3,419 ;	598 ;	1169.
madraspatana ...	3,422 ;	600 ;	424.
Moluccana ...	3,417 ;	598 ;	— ; no drawing.
paniculata ...	3,418 ;	598 ;	1640.
parviflora ...	3,420 ;	599 ;	1638.
sternutatoria ...	3,423 ;	600 ;	1286.
vulgaris ...	3,420 ;	599 ;	— ; no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
Artocarpus 2246				
Chaplasha ...	3,525 ;	634 ;	1664 ;	Wight Ic. 682.
echinata ...	3,527 ;	635 ;	2365 ;	Wight Ic. 680.
hirsuta ...	3,521 ;	633 ;	2096.	
incisa ...	3,527 ;	633 ;	— ;	no drawing.
integrifolia ...	3,522 ;	633 ;	678 ;	Pl. Corom. 250 ; Wight Ic. 678.
Lakoocha ...	3,524 ;	634 ;	984 ;	Wight Ic. 681.
lanceaefolia ...	3,527 ;	635 ;	— ;	no drawing ; Wight Ic. 679.
Arum 2217				
bulbiferum ...	3,510 ;	629 ;	1659 ;	Wight Ic. 783.
campanulatum ...	3,509 ;	629 ;	252 & 980 ;	Pl. Corom. 272 ; Wight Ic. 782 & 785.
Colocasia ...	3,494 ;	624 ;	247 ;	Wight Ic. 786 fig. 1.
cucullatum ...	3,501 ;	626 ;	1656 ;	Wight Ic. 787 ; the drawing is named <i>Arum ramosum</i> Roxb., this was the original name in Roxburgh's MSS. but in the Kew copy he has altered it to <i>A. cucullatum</i> .
curvatum ...	3,506 ;	628 ;	981 ;	Wight Ic. 788.
cuspidatum ...	3,506 ;	628 ;	1657 ;	Wight Ic. 780.
divaricatum ...	3,503 ;	627 ;	1994 ;	Wight Ic. 790.
flagelliforme ...	3,502 ;	627 ;	982 ;	Wight Ic. 791.
fornicatum ...	3,501 ;	626 ;	249 & 1655 ;	Wight Ic. 789 & 792.
gracile ...	3,505 ;	628 ;	2361 ;	Wight Ic. 793.
Indicum ...	3,498 ;	625 ;	2094 ;	Wight Ic. 794.
lyratum ...	3,508 ;	629 ;	251.	
margaritifерum ...	3,512 ;	630 ;	1907 ;	Wight Ic. 795.
montanum ...	3,497 ;	625 ;	248 ;	Wight Ic. 796.
nymphacifolium ...	3,495 ;	624 ;	— ;	no drawing ; Wight Ic. 786 fig. 2.
odorum ...	3,499 ;	626 ;	2095 ;	Wight Ic. 797.
orixense ...	3,503 ;	627 ;	246 ;	Wight Ic. 801 ; an unnumbered drawing, different from 246, is marked "Ic. Roxburgh" in pencil by J. D. Hooker, has the "Icones Roxburghianae" label, and is named "orixense" in Roxburgh's hand.
rapiforme ...	3,497 ;	625 ;	2549 ;	no drawing.
sessiliflorum ...	3,507 ;	628 ;	1658 ;	Wight Ic. 800.
sylvaticum ...	3,511 ;	620 ;	250 ;	Wight Ic. 802.
trilobatum ...	3,505 ;	627 ;	1293 ;	Wight Ic. 803.
viviparum ...	3,496 ;	625 ;	2140 ;	Wight Ic. 798.
Arundo 389				
bengalensis ...	1,348 ;	117 ;	1331 ;	drawing is named <i>Arundo bifaria</i> , evidently by error.
bifaria ...	1,347 ;	116 ;	853.	
Karka ...	1,347 ;	117 ;	854.	
Asclepias 679				
acida ...	2,31 ;	251 ;	607 ;	Wight Ic. 595.
acuminata ...	2,55 ;	259 ;	— ;	no drawing.
annularia ...	2,37 ;	253 ;	613 ;	Wight Ic. 597.
asthmatica ...	2,33 ;	252 ;	608.	
echinata ...	2,44 ;	256 ;	616 ;	Wight Ic. 596.
geminata ...	2,45 ;	256 ;	617.	
gigantea ...	2,30 ;	251 ;	606 ;	no drawing.
herbacea ...	2,50 ;	258 ;	1544 ;	Wight Ic. 492.
laurifolia ...	2,49 ;	257 ;	1814 ;	Wight Ic. 598.
longistigma ...	2,46 ;	255 ;	619 ;	Wight Ic. 475.
micrantha ...	2,50 ;	257 ;	— ;	no drawing.
microphylla ...	2,36 ;	253 ;	610.	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Asclepias—continued</i>			
montana ...	2,45 ;	256 ;	618 ; Wight Ic. 592.
odoratissima ...	2,46 ;	256 ;	122.
pallida ...	2,48 ;	257 ;	2129 ; Wight Ic. 585.
parasitica ...	2,42 ;	255 ;	1382 ; Wight Ic. 587.
pendula ...	2,37 ;	253 ;	612 ; Wight Ic. 474.
pseudo-sarsa ...	2,39 ;	254 ;	212 ; Wight Ic. 594.
pulchella ...	2,54 ;	259 ;	2466.
racemosa ...	2,32 ;	252 ;	1813 ; Wight Ic. 591.
rosea ...	2,40 ;	254 ;	217 ; Pl. Corom. 217 as <i>Periploca</i> <i>esculenta</i> .
suberosa ...	2,38 ;	254 ;	614.
sussucla ...	2,31 ;	251 ;	— ; no drawing.
tenacissima ...	2,51 ;	258 ;	1381 ; drawing missing ; Pl. Corom. 240 ; Wight Ic. 590.
tenuissima ...	2,41 ;	255 ;	1383 ; Wight Ic. 588.
tinctoria ...	2,43 ;	255 ;	615 ; Wight Ic. 589.
tingens ...	2,53 ;	258 ;	1226 ; drawing missing ; Pl. Corom. 239 ; Wight Ic. 593.
tunicata ...	2,34 ;	253 ;	609.
volubilis ...	2,36 ;	253 ;	611 ; Wight Ic. 586.
<i>Asparagus</i> 970			
acerosus ...	2,150 ;	290 ;	1823.
adscendens ...	2,153 ;	291 ;	1825.
Curillus ...	2,152 ;	291 ;	1824.
officinalis ...	2,150 ;	290 ;	— ; no drawing.
racemosus ...	2,152 ;	291 ;	1397.
<i>Asphodelus</i> 967			
clavatus ...	2,148 ;	290 ;	— ; no drawing.
<i>Asplenium</i>			
bipinnatum ...	— ;	756 ;	2000.
cicutarium ...	— ;	756 ;	— ; no drawing.
coriaceum ...	— ;	755 ;	— ; no drawing.
crenatum ...	— ;	755 ;	— ; no drawing.
cultrifolium ...	— ;	755 ;	— ; no drawing.
hemionitioides ...	— ;	755 ;	— ; no drawing.
linguaeforme ...	— ;	755 ;	— ; no drawing.
mixtum ...	— ;	755 ;	— ; no drawing.
monanthemoides ...	— ;	755 ;	— ; no drawing.
multiflorum ...	— ;	755 ;	— ; no drawing.
Nidus ...	— ;	755 ;	— ; no drawing.
radiatum ...	— ;	749 ;	— ; no drawing.
reticulatum ...	— ;	755 ;	— ; no drawing.
serrulatum ...	— ;	755 ;	— ; no drawing.
trapeziforme ...	— ;	755 ;	— ; no drawing.
tripinnatum ...	— ;	755 ;	— ; no drawing.
varium ...	— ;	755 ;	— ; no drawing.
woodwardioides ...	— ;	756 ;	— ; no drawing.
<i>Aster</i> 2148			
chinensis ...	3,433 ;	603 ;	— ; no drawing.
trinervius ...	3,433 ;	603 ;	1903 ; also an unnumbered drawing which is a replica of 1903.
<i>Astragalus</i> 2096			
hamosus ...	3,387 ;	588 ;	— ; no drawing.
<i>Athanasia</i> 2129			
indica ...	3,417 ;	598 ;	423.
<i>Atragene</i> 1586			
zeylanica ...	2,670 ;	457 ;	155 ; Pl. Corom. 188.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Averrhoa 1312			
Bilimbi ...	2,451 ;	387 ;	2063.
Carambola ...	2,450 ;	387 ;	944.
Avicennia 1608			
tomentosa ...	3,88 ;	487 ;	1576.
Bacobotrys 731			
glabra ...	1,560 ;	188 ;	— ; no drawing.
indica ...	1,557 ;	187 ;	2040.
nemoralis ...	1,559 ;	188 ;	2440 ; No. 2439 on drawing.
ramentacea ...	1,558 ;	187 ;	2125.
tetrandra ...	1,560 ;	188 ;	— ; no drawing.
Bambusa 1012			
arundinacea ...	2,191 ;	303 ;	867 ; Pl. Corom. 79, sub <i>Bambos</i> .
baccifera ...	2,197 ;	305 ;	1401 ; drawing missing ; Pl. Corom. 243 ; an unnumbered drawing at Kew differs only slightly from Pl. Corom. 243.
Balcooa ...	2,196 ;	305 ;	1402.
nana ...	2,199 ;	306 ;	— ; no drawing.
spinosa ...	2,198 ;	305 ;	1964.
stricta ...	2,193 ;	304 ;	868 ; Pl. Corom. 80, sub <i>Bambos</i> .
Tulda ...	2,193 ;	304 ;	1403.
Barleria 1638			
buxifolia ...	3,37 ;	470 ;	1472.
caerulea ...	3,39 ;	471 ;	36.
ciliata ...	3,38 ;	471 ;	1471.
cristata ...	3,37 ;	471 ;	1074.
dichotoma ...	3,39 ;	471 ;	1151.
longiflora ...	3,40 ;	471 ;	332.
prionites ...	3,36 ;	470 ;	331.
Barringtonia 1548			
acutangula ...	2,635 ;	446 ;	149.
racemosa ...	2,634 ;	446 ;	2081 ; Wight Ic. 152.
speciosa ...	2,636 ;	446 ;	— ; no drawing.
Basella 512			
alba ...	2,104 ;	275 ;	1047.
Bassia 1421			
butyracea ...	2,527 ;	411 ;	1568.
latifolia ...	2,526 ;	411 ;	29 ; Pl. Corom. 19.
longifolia ...	2,523 ;	410 ;	2072.
Batis 2524			
fruticosa ...	3,763 ;	715 ;	— ; no drawing.
spinosa ...	3,762 ;	715 ;	119.
Bauhinia 1155			
acuminata ...	2,324 ;	346 ;	942.
anguina ...	2,328 ;	347 ;	2239 ; Pl. Corom. 285.
candida ...	2,318 ;	344 ;	634.
cordifolia ...	2,332 ;	348 ;	— ; no drawing.
corymbosa ...	2,329 ;	347 ;	2240.
ferruginea ...	2,331 ;	348 ;	1137.
integrifolia ...	2,331 ;	348 ;	1138.
malabarica ...	2,321 ;	345 ;	— ; no drawing.
parviflora ...	2,323 ;	345 ;	153.
piperifolia ...	2,327 ;	347 ;	— ; no drawing.
purpurea ...	2,320 ;	344 ;	635.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Bauhinia</i> —continued			
racemosa ...	2,325 ;	346 ;	53.
retusa ...	2,322 ;	345 ;	1237 ; drawing is named <i>B. emarginata</i> , and this is the name in the Kew MS.
scandens ...	2,326 ;	346 ;	2238 ; Wight Ic. 264.
semi-bifida ...	2,330 ;	348 ;	1967 ; Wight Ic. 263.
tomentosa ...	2,323 ;	345 ;	1552.
triandra ...	2,320 ;	344 ;	1239.
variegata ...	2,319 ;	344 ;	1238.
<i>Begonia</i> 2391			
aptera ...	3,650 ;	676 ;	— ; no drawing.
laciniata ...	3,649 ;	676 ;	2382.
malabarica ...	3,648 ;	676 ;	2381.
<i>Beilschmiedia</i>			
Roxburghiana ...	2,311 ;	341 ;	2052 ; Wight Ic. 1828 ; in Fl. Ind. as <i>Laurus bilocularis</i> .
<i>Bentinckia</i> 2361			
Condapanna ...	3,621 ;	667 ;	— ; no drawing.
<i>Berberis</i> 1002			
angustifolia ...	2,183 ;	301 ;	1963.
asiatica ...	2,182 ;	300 ;	1962.
pinnata ...	2,184 ;	301 ;	2475.
<i>Bergera</i> 1228			
integerrima ...	2,376 ;	362 ;	1241.
königii ...	2,375 ;	362 ;	642 ; Pl. Corom. 112.
<i>Bergia</i> 1318			
ammanioides ...	2,457 ;	389 ;	552.
aquatica ...	see below		
verticillata ...	2,456 ;	389 ;	651 ; Pl. Corom. 142, as <i>B. aquatica</i> .
<i>Berria</i> 1553			
Ammonilla ...	2,639 ;	447 ;	1449 ; Pl. Corom. 264.
<i>Beta</i> 516			
bengalensis ...	2,59 ;	260 ;	1127.
<i>Bidens</i> 2123			
bipinnata ...	3,411 ;	596 ;	1635.
trifida ...	3,411 ;	596 ;	1901.
<i>Bignonia</i> 1726			
chelonioides ...	3,106 ;	493 ;	100.
comosa ...	3,103 ;	492 ;	— ; no drawing.
crispa ...	3,103 ;	493 ;	1877.
grandiflora ...	3,105 ;	493 ;	960.
indica ...	3,110 ;	495 ;	28.
quadrilocularis ...	3,107 ;	494 ;	317 ; Pl. Corom. 145.
spathacea ...	3,103 ;	492 ;	316 ; Pl. Corom. 144.
stipulata ...	3,108 ;	494 ;	— ; no drawing.
suaveolens ...	3,104 ;	493 ;	1147.
suberosa ...	3,111 ;	495 ;	1577 ; drawing missing ; Pl. Corom. 214.
undulata ...	3,101 ;	492 ;	1876.
xylocarpa ...	3,108 ;	494 ;	2076.
<i>Bixa</i> 1488			
orellana ...	2,581 ;	429 ;	— ; no drawing.
<i>Blackburnia</i> 460			
monadelphæa ...	1,415 ;	139 ;	171.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Blechnum</i>				
angustifolium ...	— ;	757 ;	— ;	no drawing.
decurrens ...	— ;	757 ;	— ;	no drawing.
glabrum ...	— ;	757 ;	— ;	no drawing.
moluccanum ...	— ;	757 ;	— ;	no drawing.
<i>Boerhaavia</i> 160				
procumbens ...	1,146 ;	49 ;	1315 ;	there is also an unnumbered drawing quite different from 1315, and not certainly a Roxburgh plate.
<i>Bombax</i> 1812				
gossypinum ...	3,169 ;	515 ;	661.	
heptaphylla ...	3,167 ;	514 ;	1483 ;	Pl. Corom. 247.
pentandrum ...	3,165 ;	513 ;	1484.	
<i>Borago</i> 604				
indica ...	1,458 ;	154 ;	1349.	
spinulosa ...	1,459 ;	154 ;	— ;	no drawing.
zeylanica ...	1,458 ;	154 ;	1350.	
<i>Borassus</i> 2554				
flabelliformis ...	3,790 ;	724 ;	478 & 479 ;	Pl. Corom. 71 & 72.
<i>Bosea</i> 908				
trinervia ...	2,87 ;	270 ;	134.	
<i>Boswellia</i> 1238				
glabra ...	2,384 ;	365 ;	51 ;	drawing missing ; Pl. Corom. 207.
thurifera ...	2,383 ;	365 ;	1429 ;	the drawing bears the name <i>Boswellia serrata</i> Roxb. and this name was published by Colebrooke in <i>Asiat. Res.</i> 9, 379, t. 5 (1807) who reproduced Roxburgh's picture in colour. In the Kew MS. the name is <i>B. thurifera</i> Roxb., and this was published by Fleming in <i>Asiat. Res.</i> 11, 158 (1810).
<i>Bradleya</i> 2446				
hirsuta ...	3,699 ;	693 ;	2559 ;	No. 2552 on drawing which is uncoloured.
impubera ...	3,698 ;	693 ;	— ;	no drawing.
lanceolaria ...	3,697 ;	692 ;	2398.	
multilocularis ...	3,696 ;	692 ;	1699.	
nitida ...	3,699 ;	693 ;	471 ;	also an unnumbered drawing which differs from 471.
pinnata ...	3,700 ;	693 ;	1700.	
pubera ...	3,699 ;	693 ;	— ;	no drawing.
Sinica ...	3,700 ;	693 ;	— ;	no drawing.
<i>Brassica</i> 1748				
erucoides ...	3,117 ;	497 ;	— ;	no drawing.
oleracea ...	3,117 ;	497 ;	— ;	no drawing.
Rapa ...	3,117 ;	497 ;	— ;	no drawing.
<i>Briedelia</i> 2489				
crenulata ...	3,734 ;	705 ;	2145.	
lanceaefolia ...	3,737 ;	706 ;	— ;	no drawing.
montana ...	3,735 ;	705 ;	112 ;	<i>Cluytia montana</i> on drawing and in Kew MS.
scandens ...	3,736 ;	706 ;	114 ;	<i>Cluytia scandens</i> on drawing and in Kew MS.
spinosa ...	3,736 ;	706 ;	113 ;	<i>Cluytia spinosa</i> on drawing and in Kew MS.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Bromelia</i> 931			
<i>ananas</i> ...	2,116 ;	279 ;	— ; no drawing.
<i>Brucea</i> 490			
<i>sumatrana</i> ...	1,449 ;	151 ;	1529.
<i>Bryonia</i> 2478			
<i>filiformis</i> ...	3,727 ;	703 ;	1697.
<i>Garcini</i> ...	3,727 ;	703 ;	468.
<i>glabra</i> ...	3,726 ;	702 ;	467.
<i>laciniosa</i> ...	3,728 ;	703 ;	— ; no drawing.
<i>pilosa</i> ...	3,726 ;	703 ;	469.
<i>scabrella</i> ...	3,724 ;	702 ;	466.
<i>tenella</i> ...	3,725 ;	702 ;	2100.
<i>Buchanania</i> 1239			
<i>angustifolia</i> ...	2,386 ;	366 ;	2244 ; Pl. Corom. 262.
<i>lanceifolia</i> ...	2,386 ;	366 ;	— ; no drawing.
<i>latifolia</i> ...	2,385 ;	365 ;	103 ; a drawing of flowering shoot seems undoubtedly No. 103, though the number is missing. Another, unnumbered, drawing shows fruiting material,
<i>Buchnera</i> 1631			
<i>asiatica</i> ...	3,31 ;	468 ;	320.
<i>euphrasioides</i> ...	3,32 ;	469 ;	— ; no drawing.
<i>Buddleia</i> 438			
<i>Neemda</i> ...	1,396 ;	133 ;	1208.
<i>Burmanna</i> 931			
<i>disticha</i> ...	2,117 ;	279 ;	1230 ; Pl. Corom. 242.
<i>triflora</i> ...	2,117 ;	280 ;	2471 ; No. 2469 on drawing.
<i>Butea</i> 1912			
<i>frondosa</i> ...	3,244 ;	540 ;	67 ; Pl. Corom. 21.
<i>parviflora</i> ...	3,248 ;	541 ;	1990.
<i>superba</i> ...	3,247 ;	541 ;	68 ; Pl. Corom. 22.
<i>Butomus</i> 1152			
<i>lanceolatus</i> ...	2,315 ;	343 ;	— ; no drawing.
<i>Buttnera</i> 836			
<i>herbacea</i> ...	1,619 ;	208 ;	190 ; Pl. Corom. 29.
<i>pilosa</i> ...	1,618 ;	207 ;	2044.
<i>Calalia</i> 2124			
<i>bicolor</i> ...	3,412 ;	596 ;	1284 ; also an unnumbered drawing, which is different from 1284, and "very bad" as noted in Rox- burgh's hand.
<i>reclinata</i> ...	3,412 ;	596 ;	1168.
<i>sonchifolia</i> ...	3,413 ;	596 ;	422.
<i>Cactus</i> 1242			
<i>chinensis</i> ...	2,476 ;	395 ;	2134.
<i>indicus</i> ...	2,475 ;	395 ;	946.
<i>Caesalpinia</i> 1203			
<i>Bonduc</i> ...	2,362 ;	358 ;	— ; no drawing.
<i>Bonducella</i> ...	2,357 ;	356 ;	641.
<i>chinensis</i> ...	2,361 ;	358 ;	— ; no drawing.
<i>cucullata</i> ...	2,358 ;	357 ;	1840.
<i>ennea-phylla</i> ...	2,363 ;	358 ;	1425.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Caesalpinia—continued</i>				
inermis ...	2,367 ;	359 ;	— ;	no drawing.
lacerans ...	2,367 ;	359 ;	60 ;	no drawing.
oleosperma ...	2,357 ;	356 ;	59.	
paniculata ...	2,364 ;	358 ;	1553.	
resupinata ...	2,362 ;	358 ;	1424.	
Sappan ...	2,357 ;	356 ;	40 ;	Pl. Corom. 16.
sepiaria ...	2,360 ;	357 ;	1240.	
Simora ...	2,359 ;	357 ;	1841 ;	Wight Ic. 392.
Sumatрана ...	2,366 ;	359 ;	1423.	
tortuosa ...	2,365 ;	359 ;	1426.	
<i>Caesulia</i> 2165				
axillaris ...	3,447 ;	608 ;	438 ;	Pl. Corom 93.
<i>Calamus</i> 2536				
Draco ...	3,774 ;	719 ;	— ;	no drawing.
erectus ...	3,774 ;	719 ;	— ;	no drawing.
extensus ...	3,777 ;	720 ;	— ;	no drawing.
fasciculatus ...	3,779 ;	721 ;	1191.	
gracilis ...	3,781 ;	721 ;	1918.	
humilis ...	3,773 ;	719 ;	— ;	no drawing.
latifolius ...	3,775 ;	719 ;	2149.	
monoicus ...	3,783 ;	722 ;	— ;	no drawing.
pencilatus ...	3,781 ;	721 ;	— ;	no drawing.
polygamus ...	3,780 ;	721 ;	— ;	no drawing.
quinquenervius ...	3,777 ;	720 ;	— ;	no drawing.
Rotang ...	3,777 ;	720 ;	1190.	
rudentus ...	3,776 ;	719 ;	— ;	no drawing.
tenuis ...	3,780 ;	721 ;	2148 ;	"tenuis" in Fl. Ind. by error.
verus ...	3,776 ;	720 ;	— ;	no drawing.
Zalacca ...	3,773 ;	719 ;	— ;	no drawing.
<i>Calla</i> 2238				
aromatica ...	3,513 ;	630 ;	2362 ;	Wight Ic. 805.
calyptrata ...	3,514 ;	631 ;	1661 ;	Wight Ic. 799.
oblongifolia ...	3,516 ;	631 ;	1663 ;	Wight Ic. 806.
picta ...	3,516 ;	631 ;	1662 ;	Wight Ic. 804.
rubescens ...	3,515 ;	631 ;	1660 ;	Wight Ic. 807 ; drawing named <i>Calla oculta</i> Roxb. which was the original name in the Kew MS. where it has been altered by Roxburgh to <i>C. rubescens</i> .
virosa ...	3,517 ;	632 ;	2363 ;	Wight Ic. 806.
<i>Callicarpa</i> 433				
acuminata ...	1,394 ;	132 ;	— ;	no drawing.
alternifolia ...	1,595 ;	200 ;	165.	
arborea ...	1,390 ;	131 ;	2033.	
cana ...	1,392 ;	131 ;	1338 ;	<i>Callicarpa dentata</i> Roxb. on the drawing and in the Kew MS.
cuspidata ...	1,394 ;	132 ;	— ;	no drawing.
incana ...	1,393 ;	131 ;	914 ;	according to Roxburgh in the Kew MS, the drawing no. 914 is <i>C. incana</i> , but the description under that number is <i>C. macrophylla</i> . There is an unnumbered plate of <i>C. incana</i> which is quite different from no. 914.
lanata ...	1,391 ;	131 ;	164.	
lanceolaria ...	1,395 ;	132 ;	2178.	
longifolia ...	1,394 ;	132 ;	— ;	no drawing.
macrophylla ...	1,393 ;	132 ;	914 ;	no drawing.
pentandra ...	1,395 ;	132 ;	— ;	no drawing.
purpurea ...	1,395 ;	132 ;	— ;	no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Calophyllum 1519			
angustifolium ...	2,608 ;	437 ;	— ; no drawing.
Bintagor ...	2,607 ;	437 ;	— ; no drawing.
inophyllum ...	2,606 ;	437 ;	950.
lanceolarium ...	2,608 ;	438 ;	— ; no drawing.
Suriga ...	2,608 ;	438 ;	— ; no drawing.
tetrapetalum ...	2,608 ;	438 ;	1563.
Calycanthus 1588			
praecox ...	2,672 ;	458 ;	— ; no drawing.
Campanula 727			
dehiscens ...	1,504 ;	169 ;	1217.
lancifolia ...	1,505 ;	169 ;	— ; no drawing.
Camunium 828			
chinense ...	1,636 ;	214 ;	2446.
Canarina 994			
moluccana ...	2,173 ;	298 ;	— ; no drawing.
Canarium 1774			
bengalense ...	3,136 ;	504 ;	2311.
commune ...	3,137 ;	504 ;	— ; no drawing.
nigrum ...	3,138 ;	504 ;	— ; no drawing.
strictum ...	3,138 ;	504 ;	— ; no drawing.
sylvestre ...	3,137 ;	504 ;	— ; no drawing.
Canna 13			
Indica ...	1,1 ;	1 ;	— ; no drawing.
Cannabis 2535			
sativa ...	3,772 ;	718 ;	— ; no drawing.
Cansjera 487			
scandens ...	1,441 ;	148 ;	152 ; Pl. Corom. 103.
Canthium 773			
angustifolium ...	1,533 ;	179 ;	2124.
didymum ...	1,535 ;	180 ;	15.
moluccanum ...	1,536 ;	180 ;	— ; no drawing.
parviflorum ...	1,534 ;	179 ;	184 ; drawing missing ; Pl. Corom. 51.
parvifolium ...	1,534 ;	179 ;	2195.
Capparis 1471			
acuminata ...	2,566 ;	424 ;	656.
bisperma ...	2,569 ;	425 ;	156.
corymbosa ...	2,569 ;	425 ;	158.
heteroclita ...	2,570 ;	425 ;	160 & 2516 ; No. 2511 on drawing.
sepiaria ...	2,568 ;	425 ;	159.
subspinosa ...	2,568 ;	425 ;	— ; no drawing.
trifoliata ...	2,571 ;	426 ;	157.
zeylanica ...	2,567 ;	425 ;	161.
Capraria 1715			
diffusa ...	3,93 ;	489 ;	2075.
gratissima ...	3,92 ;	489 ;	319.
Capsicum 549			
annuum ...	1,573 ;	193 ;	sub 1221/2 ; no drawing.
cerasiforme ...	1,574 ;	193 ;	— ; no drawing.
frutescens ...	1,574 ;	193 ;	sub 1221/4 ; no drawing.
grossum ...	1,574 ;	193 ;	sub 1221/3 ; no drawing.
minimum ...	1,574 ;	193 ;	sub 1221/5 ; no drawing.
purpureum ...	1,573 ;	192 ;	1221.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Carallia 1347			
<i>lancaefolia</i> ...	2,481 ;	397 ;	2508 ; No. 2505 on drawing ; Wight Ic. 604.
<i>lucida</i> ...	2,481 ;	396 ;	77 ; Pl. Corom 211 ; Wight Ic. 605.
Cardiospermum 1125			
<i>Halicacabum</i> ...	2,292 ;	335 ;	— ; no drawing.
Carduus 2119			
<i>lanatus</i> ...	3,408 ;	595 ;	1084 .
<i>radicans</i> ...	3,408 ;	595 ;	1634 .
<i>ramosus</i> ...	3,407 ;	595 ;	420 .
Carex 2306			
<i>Bengalensis</i> ...	3,572 ;	651 ;	— ; no drawing.
Careya 1551			
<i>arborea</i> ...	2,638 ;	447 ;	142 ; drawing missing ; Pl. Corom. 218 ; there is an unnumbered drawing but it is quite different from Pl. Corom. 218.
<i>herbacea</i> ...	2,638 ;	447 ;	1437 ; Pl. Corom. 217 ; Wight Ic. 557 ; an unnumbered drawing agrees very closely with 1437.
<i>sphaerica</i> ...	2,636 ;	446 ;	2082 ; Wight Ic. 147 & 556.
Carica 2590			
<i>Papaya</i> ...	3,824 ;	736 ;	1092 ; no drawing.
Carissa 631			
<i>axillaris</i> ...	1,691 ;	232 ;	— ; no drawing.
<i>Carandas</i> ...	1,687 ;	231 ;	8 ; Pl. Corom. 77 ; Wight Ic. 426.
<i>diffusia</i> ...	1,689 ;	231 ;	1378 ; Wight Ic. 427.
<i>villosa</i> ...	1,690 ;	232 ;	2047 ; Wight Ic. 437.
Carpopogon 1969			
<i>atropurpureum</i> ...	3,287 ;	554 ;	2326 .
<i>bracteatum</i> ...	— ;	— ;	2539 ; No. 2533 on drawing ; this is the name in Roxb. Hort. Beng. 54 and in the Kew MS. It is not in Flora Indica.
<i>capitatum</i> ...	3,284 ;	553 ;	285 .
<i>giganteum</i> ...	3,287 ;	554 ;	2325 .
<i>imbricatum</i> ...	— ;	— ;	2538 ; No. 2532 on drawing ; the name is in Roxb. Hort. Beng. 54 and in the Kew MS. but not in Flora Indica.
<i>monospermum</i> ...	3,284 ;	553 ;	286 .
<i>niveum</i> ...	3,285 ;	554 ;	1601 .
<i>pruriens</i> ...	3,283 ;	553 ;	284 .
Carrallia* 1347			
<i>lancaefolia</i> ...	2,481 ;	397 ;	2508 ; No. 2505 on drawing ; Wight Ic. 604.
<i>lucida</i> ...	2,481 ;	396 ;	77 ; Pl. Corom. 211 ; Wight Ic. 605.
Carthamus 2121			
<i>tinctorius</i> ...	3,409 ;	595 ;	— ; no drawing.
Caryota 2365			
<i>urens</i> ...	3,625 ;	668 ;	1089 .

* As this in Clarke's reprint ; *Carallia* in Flora Indica (1832).

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
Casearia 1279				
esculenta ...	2,422 ;	377 ;	148 ;	no drawing.
glabra ...	2,421 ;	377 ;	1554.	
glomerata ...	2,419 ;	376 ;	2250.	
ovata ...	2,420 ;	377 ;	1431.	
tomentosa ...	2,421 ;	377 ;	147 ;	there is an unnumbered plate named <i>C. glabra</i> which is quite unlike <i>C. glabra</i> Roxb. from the Moluccas, No. 1554, but which is very similar to <i>C. tomentosa</i> ; it may perhaps represent the <i>C. glabra</i> "Hort. Calc." which is referred to <i>C. tomentosa</i> in Hook. f. Fl. Brit. Ind. 2, 593.
Vareca ...	2,418 ;	376 ;	2249.	
Cassia 1174				
bacillus ...	2,337 ;	350 ;	1836.	
fistula ...	2,333 ;	348 ;	1833.	
marginata ...	2,338 ;	350 ;	1837.	
nodosa ...	2,336 ;	349 ;	1835 ;	Wight Ic. 410.
rhombifolia ...	2,334 ;	349 ;	1834.	
speciosa ...	— ;	— ;	1061 ;	so named in Roxb. Hort. Beng. 31 (1814) ; in Flora Indica (1832) sub <i>Senna</i> .
sumatrana ...	— ;	— ;	1421 ;	ditto
tenella ...	— ;	— ;	1422 ;	ditto.
toroides ...	— ;	— ;	1417 ;	ditto.
Cassya 1150				
filiformis ...	2,314 ;	342 ;	633.	
Castanea 2385				
Indica ...	3,643 ;	674 ;	2394 ;	Wight Ic. 417.
pumila ...	3,644 ;	675 ;	— ;	no drawing.
Casuarina 2245				
muricata ...	3,519 ;	632 ;	1667.	
Caturus 2521				
spiciflorus ...	3,760 ;	714 ;	— ;	no drawing.
Ceanothus				
asiatica ...	1,615 ;	207 ;	— ;	no drawing.
Cedrela 826				
Toona ...	1,635 ;	213 ;	922 ;	Pl. Corom. 238.
Celastrus 871				
emarginata ...	1,620 ;	208 ;	593.	
micrantha ...	1,625 ;	210 ;	— ;	no drawing.
monosperma ...	1,625 ;	210 ;	2184.	
montana ...	1,620 ;	208 ;	594.	
multiflora ...	1,622 ;	209 ;	1806.	
nutans ...	1,623 ;	209 ;	1805.	
obtusifolia ...	1,625 ;	210 ;	— ;	no drawing.
paniculata ...	1,621 ;	209 ;	188.	
robusta ...	1,626 ;	210 ;	2185.	
trigyna ...	1,624 ;	209 ;	— ;	no drawing.
verticillata ...	1,624 ;	209 ;	1804.	
Celosia 527				
argentea ...	1,679 ;	228 ;	— ;	no drawing.
baccata ...	1,682 ;	229 ;	929 ;	drawing named <i>Celosia baccata</i> and this was the original name in the Kew MS., where Roxburgh has altered it to <i>Deeringia celosioides</i> .

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Celosia—continued</i>			
cernua ...	1,680 ;	228 ;	1376 ; Wight Ic. 730.
comosa ...	1,679 ;	228 ;	— ; no drawing.
corymbosa ...	1,681 ;	229 ;	587.
cristata ...	1,679 ;	228 ;	— ; no drawing.
polysperma ...	1,682 ;	229 ;	— ; no drawing.
tetragyna ...	1,683 ;	229 ;	1377 ; this is the name on the drawing and in the Kew MS. ; in <i>Flora Indica</i> the plant is under <i>Deeringia tetragyna</i> .
<i>Celsia</i> 1720			
coromandeliana ...	3,100 ;	491 ;	1460.
<i>Celtis</i> 903			
orientalis ...	2,65 ;	262 ;	1195 ; Wight Ic. 602 & 603.
tetrandra ...	2,63 ;	262 ;	1999.
tomentosa ...	2,66 ;	263 ;	— ; no drawing.
trinervia ...	2,65 ;	262 ;	2211.
<i>Cenchrus</i> 254			
biflorus ...	1,233 ;	78 ;	2110.
<i>Centaurea</i> 2160			
lanata ...	3,444 ;	607 ;	1993.
moschata ...	3,444 ;	607 ;	— ; no drawing.
<i>Cerastium</i> 1319			
cordifolium ...	2,458 ;	389 ;	1245.
<i>Ceratophyllum</i> 236			
verticillatum ...	3,624 ;	668 ;	1910 ; also an unnumbered drawing almost identical with No. 1910.
<i>Ceratostema</i> 1272			
vaccinacea ...	2,412 ;	374 ;	2248.
variegata ...	2,413 ;	375 ;	2247 ; no drawing.
<i>Cerbera</i> 639			
dichotoma ...	2,23 ;	249 ;	1541 ; the drawing is named <i>Cerbera dichotoma</i> and this is the name in the Kew MS. ; in <i>Flora Indica</i> the plant is under <i>Tabernaemontana dichotoma</i> .
fruticosa ...	1,691 ;	232 ;	2200 ; Wight Ic. 431.
maculata ...	1,693 ;	233 ;	— ; no drawing.
Odollam ...	1,692 ;	232 ;	930 & 2200/a (dissections only) ; Wight Ic. 441 ; there is an unnumbered drawing named <i>Cerbera manghas</i> on which Roxburgh has written in pencil “ <i>Cerbera Odollam Gaert.</i> ”—it is quite different from No. 930.
<i>Ceropegia</i> 1703			
acuminata ...	2,28 ;	251 ;	204 ; Pl. Corom. 8.
bulbosa ...	2,27 ;	250 ;	201 ; Pl. Corom. 7.
Candelabrium ...	2,27 ;	250 ;	— ; no drawing.
junceae ...	— ;	— ;	202 ; Pl. Corom. 10 ; apparently omitted from <i>Flora Indica</i> .
tuberosa ...	— ;	— ;	203 ; Pl. Corom. 9 ; apparently omitted from <i>Flora Indica</i> .
<i>Chara</i> 2296			
furcata ...	3,564 ;	648 ;	700 (no drawing), 1666.
involucrata ...	3,656 ;	648 ;	1665.
verticillata ...	3,563 ;	647 ;	699.
<i>Chaulmoogra</i> 2602			
odorata ...	3,836 ;	740 ;	2409 ; Pl. Corom. 299 as <i>Gynocardia odorata</i> .

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Chavica</i>				
Betle	— ;	— ;	2167 ;	Wight Ic. 1926 ; as <i>Piper Betle</i> in Flora Indica.
peepuloides	— ;	— ;	1518 ;	Wight Ic. 1927 ; as <i>Piper Chaba</i> in Flora Indica.
Roxburghii	— ;	— ;	681 ;	Wight Ic. 1928 ; as <i>Piper longum</i> in Flora Indica.
sarmentosa	— ;	— ;	1519 ;	Wight Ic. 1929 ; as <i>Piper sarmentosa</i> in Flora Indica.
silvatica	— ;	— ;	2168 ;	Wight Ic. 1930 ; as <i>Piper silvaticum</i> in Flora Indica.
<i>Chenopodium</i> 518				
album	2,58 ;	260 ;	— ;	no drawing.
lacinatum	2,59 ;	260 ;	— ;	no drawing.
viride	2,58 ;	260 ;	— ;	no drawing.
<i>Chionanthus</i> 115				
dichotoma	1,108 ;	36 ;	2010 .	
ramiflora	1,107 ;	36 ;	1310 ;	Wight Ic. 734.
zeylanica	1,107 ;	36 ;	— ;	no drawing.
<i>Chironia</i> 553				
centaureoides	1,584 ;	196 ;	1123 .	
<i>Chloranthus</i> 485				
inconspicuus	1,439 ;	147 ;	— ;	no drawing.
<i>Chloris</i> 370				
barbata	1,329 ;	111 ;	881 .	
montana	1,329 ;	110 ;	882 .	
polystachya	1,330 ;	111 ;	2023 .	
tenella	1,329 ;	110 ;	2022 .	
<i>Chrysanthemum</i> 2151				
cuneatum	3,436 ;	604 ;	— ;	no drawing.
indicum	3,436 ;	604 ;	— ;	no drawing.
<i>Chrysobalanus</i> 1376				
racemosus	2,506 ;	405 ;	— ;	no drawing.
<i>Chrysophyllum</i> 717				
acuminatum	1,599 ;	201 ;	2041 .	
<i>Cicer</i> 2023				
arietinum	3,324 ;	567 ;	— ;	no drawing.
Lens	3,324 ;	567 ;	1164 .	
<i>Cinchona</i> 741				
excelsa	1,529 ;	178 ;	163 ;	Pl. Corom. 106.
thyrsiflora	1,530 ;	178 ;	1536 ;	also an unnumbered plate which is a replica of No. 1536.
<i>Cissampelos</i> 2614				
Caapeba	3,842 ;	742 ;	— ;	no drawing.
convolvulacea	3,842 ;	742 ;	187 .	
glabra	3,840 ;	741 ;	2410 .	
hernandifolia	3,842 ;	742 ;	— ;	no drawing.
hexandra	3,841 ;	742 ;	1001 .	
tetrandra	3,842 ;	742 ;	— ;	no drawing.
<i>Cissus</i> 448				
adnata	1,405 ;	136 ;	1787 ;	Wight Ic. 144.
angustifolia	1,408 ;	137 ;	2035 ;	Wight Ic. 176.
auriculata	1,412 ;	138 ;	1788 ;	Wight Ic. 145.
carnosa	1,409 ;	137 ;	541 .	
cordata	1,407 ;	136 ;	1527 .	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Cissus—continued</i>			
<i>elongata</i> ...	1,411 ;	138 ;	1528.
<i>feminea</i> ...	1,410 ;	137 ;	543.
<i>glaucia</i> ...	1,406 ;	136 ;	540.
<i>lanceolaria</i> ...	1,412 ;	138 ;	2429 ; Wight Ic. 177.
<i>pedata</i> ...	1,413 ;	138 ;	544.
<i>pentagona</i> ...	1,408 ;	137 ;	— ; no drawing.
<i>quadrangularis</i> ...	1,407 ;	136 ;	2180.
<i>serrulata</i> ...	1,414 ;	139 ;	— ; no drawing.
<i>setosa</i> ...	1,410 ;	137 ;	542.
<i>vitiginea</i> ...	1,406 ;	136 ;	539.
<i>Citrus</i> 2100			
<i>acida</i> ...	3,390 ;	589 ;	2088.
<i>Aurantium</i> ...	3,392 ;	590 ;	— ; no drawing.
<i>decumana</i> ...	3,393 ;	590 ;	— ; no drawing.
<i>inermis</i> ...	3,393 ;	590 ;	2332.
<i>medica</i> ...	3,392 ;	590 ;	— ; no drawing.
<i>Clematis</i> 1586			
<i>gouriana</i> ...	2,670 ;	457 ;	1453.
<i>Cleome</i> 1761			
<i>chelidonii</i> ...	3,127 ;	501 ;	339.
<i>diffusa</i> ...	3,129 ;	501 ;	340.
<i>monophylla</i> ...	3,129 ;	501 ;	1988.
<i>pentaphylla</i> ...	3,126 ;	500 ;	668.
<i>viscosa</i> ...	3,128 ;	501 ;	669.
<i>Clerodendron</i> 1666			
<i>inermis</i> ...	3,58 ;	477 ;	1075.
<i>phlomidoides</i> ...	3,57 ;	477 ;	333.
<i>Clinopodium</i> 1607			
<i>repens</i> ...	3,13 ;	462 ;	1869.
<i>Clitoria</i> 2019			
<i>heterophylla</i> ...	3,321 ;	566 ;	— ; no drawing.
<i>ternatea</i> ...	3,321 ;	566 ;	408.
<i>Cluytia</i> 2484			
<i>collina</i> ...	3,732 ;	704 ;	110 ; Pl. Corom. 169.
<i>diversifolia</i> ...	3,731 ;	704 ;	— ; no drawing.
<i>montana</i> ...	3,735 ;	706 ;	112 ; Pl. Corom. 171 ; as <i>Bridelia montana</i> in Flora Indica.
<i>oblongifolia</i> ...	3,730 ;	704 ;	2400.
<i>patula</i> ...	3,733 ;	705 ;	111 ; Pl. Corom. 170.
<i>scandens</i> ...	3,736 ;	706 ;	114 ; Pl. Corom. 173 ; as <i>Bridelia scandens</i> in Flora Indica.
<i>semperflorens</i> ...	3,730 ;	704 ;	2401.
<i>spinosa</i> ...	3,736 ;	706 ;	113 ; Pl. Corom. 173 ; as <i>Bridelia spinosa</i> in Flora Indica.
<i>Cnestis</i> 1316			
<i>monadelpha</i> ...	2,454 ;	388 ;	2254.
<i>Coccoloba</i> 1124			
<i>crispata</i> ...	2,292 ;	335 ;	— ; no drawing.
<i>Cocos</i> 2353			
<i>nucifera</i> ...	3,614 ;	664 ;	448 ; Pl. Corom. 73.
<i>Coffea</i> 781			
<i>angustifolia</i> ...	1,541 ;	182 ;	— ; no drawing.
<i>arabica</i> ...	1,539 ;	181 ;	— ; no drawing.

Name and page-no. in Fl. Ind. MS.		Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Coffea—continued</i>					
bengalensis	...	1,540 ;	181 ;	1031.	
pedunculata	...	1,541 ;	182 ;	— ;	no drawing.
tetrandra	...	1,538 ;	181 ;	2123.	
<i>Coix 2301</i>					
aquatica	...	3,571 ;	650 ;	1908.	
barbata	...	3,569 ;	649 ;	871.	
gigantea	...	3,570 ;	650 ;	872.	
heteroclita	...	3,572 ;	650 ;	2550 ;	No. 2543 on drawing.
lacryma	...	3,568 ;	649 ;	1088.	
pumila	...	3,572 ;	650 ;	— ;	no drawing.
<i>Coldenia 495</i>					
procumbens	...	1,448 ;	150 ;	— ;	no drawing.
<i>Colebrookia 1622</i>					
oppositifolia	...	3,26 ;	467 ;	1572.	
ternifolia	...	3,25 ;	466 ;	1571 ;	drawing missing ; Pl. Corom. 245.
<i>Columnnea 1720</i>					
balsamica	...	3,97 ;	490 ;	666.	
heterophylla	...	3,98 ;	491 ;	1268.	
minuta	...	3,98 ;	491 ;	1266.	
tomentosa	...	3,98 ;	491 ;	1076.	
<i>Comarum 1393</i>					
flavum	...	2,521 ;	409 ;	1561.	
<i>Combretum 1050</i>					
acuminatum	...	2,228 ;	315 ;	2225.	
chinense	...	2,230 ;	316 ;	1404.	
costatum	...	2,227 ;	315 ;	2478 ;	No. 2476 on drawing.
decandrum	...	2,232 ;	316 ;	138 ;	Pl. Corom. 59.
extensum	...	2,229 ;	315 ;	1830.	
laxum	...	2,231 ;	316 ;	139 ;	no drawing.
macrophyllum	...	2,231 ;	316 ;	— ;	no drawing.
ovalifolium	...	2,226 ;	314 ;	2223.	
pilosum	...	2,231 ;	316 ;	2224.	
purpureum	...	2,233 ;	317 ;	— ;	no drawing.
rotundifolium	...	2,226 ;	315 ;	2479 ;	No. 2477 on drawing.
squamosum	...	2,231 ;	316 ;	— ;	no drawing.
<i>Commelina 185</i>					
Bengalensis	...	1,171 ;	57 ;	1019.	
cespitosa	...	1,174 ;	58 ;	1317.	
communis	...	1,171 ;	57 ;	1018.	
herbacea	...	1,176 ;	59 ;	1770.	
moluccana	...	1,172 ;	58 ;	— ;	no drawing.
nana	...	1,173 ;	58 ;	1107.	
nudiflora	...	1,173 ;	58 ;	1108.	
salicifolia	...	1,172 ;	58 ;	1020.	
scapiflora	...	1,175 ;	59 ;	1521.	
<i>Commersonia 838</i>					
echinata	...	— ;	— ;	1392 ;	apparently omitted from Flora Indica.
<i>Congea</i>					
tomentosa	...	3,56 ;	477 ;	2298 ;	Pl. Corom. 293 ; as <i>Roscoea tomentosa</i> in Flora Indica.
<i>Connarus 1778</i>					
paniculatus	...	3,139 ;	505 ;	— ;	no drawing.
pentandrus	...	3,140 ;	505 ;	— ;	no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Conocarpus 1304			
acuminata ...	2,443 ;	384 ;	20.
latifolia ...	2,442 ;	384 ;	19.
Convolvulus 557			
Batatas ...	1,483 ;	162 ;	— ; no drawing.
bicolor ...	1,475 ;	159 ;	561.
bilobatus ...	1,485 ;	163 ;	1353.
blandus ...	1,470 ;	158 ;	559.
calycinus ...	1,471 ;	158 ;	1534 ; also an unnumbered drawing which is almost a replica of No. 1534.
cespitosus ...	1,483 ;	162 ;	1356.
copticus ...	1,477 ;	160 ;	563.
dentatus ...	1,477 ;	160 ;	562.
digitatus ...	1,479 ;	161 ;	566.
dissectus ...	— ;	— ;	an unnumbered drawing under this name, which is in Roxburgh, Hort. Beng. 14.
fastigiatus ...	1,468 ;	157 ;	1355.
flagelliformis ...	1,481 ;	162 ;	1359.
gangeticus ...	1,467 ;	157 ;	1793 ; also an unnumbered drawing which is almost a replica of No. 1793.
heptaphyllus ...	1,480 ;	161 ;	1950.
hirsutus ...	1,479 ;	161 ;	1533.
laurifolius ...	1,470 ;	158 ;	1794 ; also an unnumbered drawing which is a replica of No. 1794 and is named "laurifolius R." in Roxburgh's hand.
malabaricus ...	1,469 ;	157 ;	2037.
Malcolmi ...	1,474 ;	159 ;	1532.
maximus ...	1,469 ;	157 ;	— ; no drawing.
medium ...	1,475 ;	159 ;	— ; no drawing.
obscurus ...	1,472 ;	158 ;	— ; no drawing.
paniculatus ...	1,478 ;	160 ;	564.
parviflorus ...	1,471 ;	158 ;	558 ; the drawing does not fully agree with the description.
pedatus ...	1,478 ;	161 ;	— ; no drawing.
pentagonus ...	1,485 ;	163 ;	1354.
Pes-Caprae ...	1,486 ;	163 ;	2121.
pilosus ...	1,473 ;	159 ;	1357.
reniformis ...	1,481 ;	161 ;	1949.
repens ...	1,482 ;	162 ;	565.
semidigynus ...	1,486 ;	157 ;	1214.
sphaerocephalus ...	1,472 ;	158 ;	1360.
stipulaceus ...	1,484 ;	162 ;	1358.
tridentatus ...	1,475 ;	159 ;	— ; no drawing.
Turpethum ...	1,476 ;	160 ;	557.
vitifolius ...	1,476 ;	160 ;	560.
Conyza 2140			
alata ...	3,431 ;	602 ;	— ; no drawing.
angustifolia ...	3,429 ;	602 ;	1085.
aurita ...	3,428 ;	602 ;	430.
balsamifera ...	3,427 ;	601 ;	1641.
bifoliata ...	3,430 ;	602 ;	431.
corymbosa ...	3,426 ;	601 ;	1172.
diffusa ...	3,429 ;	602 ;	— ; no drawing.
fistulosa ...	3,429 ;	602 ;	428.
lacera ...	3,428 ;	601 ;	429.
laciniata ...	3,427 ;	601 ;	1642.
lanceolaria ...	3,432 ;	603 ;	2333.
pinnatifida ...	3,430 ;	602 ;	— ; no drawing.
pubigera ...	3,426 ;	601 ;	— ; no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Conyza</i> —continued			
repanda ...	3,431 ;	603 ;	2089.
salicifolia ...	3,431 ;	603 ;	— ; no drawing.
<i>Cookia</i> 1237			
punctata ...	2,382 ;	364 ;	943 ; also an unnumbered drawing which is a replica of No. 943, and bears that number in very faint pencil.
<i>Corchorus</i> 1489			
capsularis ...	2,581 ;	429 ;	902 ; no drawing ; there is an unnumbered plate which may be a copy.
decemangularis ...	2,582 ;	430 ;	— ; no drawing.
fascicularis ...	2,582 ;	429 ;	1982.
fuscus ...	2,582 ;	429 ;	903 ; no drawing.
olitorius ...	2,581 ;	429 ;	901 ; no drawing.
trilocularis ...	2,582 ;	430 ;	— ; no drawing.
<i>Cordia</i> 611			
angustifolia ...	1,595 ;	200 ;	1370.
campanulata ...	1,593 ;	199 ;	— ; no drawing.
grandis ...	1,593 ;	199 ;	— ; no drawing.
latifolia ...	1,588 ;	198 ;	1801.
moluccana ...	1,594 ;	200 ;	— ; no drawing.
monoica ...	1,592 ;	199 ;	200 ; Pl. Corom. 58.
Myxa ...	1,590 ;	198 ;	577.
polygama ...	1,594 ;	200 ;	165 & 1802 ; No. 165 is named <i>Callicarpa alternifolia</i> R.
serrata ...	1,592 ;	199 ;	2445 ; Wight Ic. 469.
<i>Coriandrum</i> 914			
sativum ...	2,94 ;	272 ;	— ; no drawing.
<i>Corypha</i> 995			
elata ...	2,176 ;	298 ;	2219.
Talliera ...	2,174 ;	298 ;	1393 (2 drawings) ; Pl. Corom. 255, 256.
umbraculifera ...	2,177 ;	299 ;	— ; no drawing.
Utan ...	2,178 ;	299 ;	— ; no drawing.
<i>Costus</i> 64			
speciosus ...	1,58 ;	20 ;	215.
<i>Cotula</i> 2152			
sinapifolia ...	3,437 ;	605 ;	1643.
<i>Cotyledon</i> 1317			
heterophylla ...	2,456 ;	388 ;	1848.
laciniata ...	2,456 ;	388 ;	650.
rhizophylla ...	2,456 ;	388 ;	1243.
<i>Crataegus</i> 1379			
crenulata ...	2,509 ;	406 ;	2071.
integrifolia ...	2,509 ;	406 ;	— ; no drawing.
<i>Cressa</i> 600			
indica ...	2,72 ;	265 ;	219.
<i>Crinum</i> 943			
amoenum ...	2,127 ;	283 ;	2472 ; No. 2470 on drawing.
augustum ...	2,136 ;	286 ;	— ; no drawing.
asiaticum ...	2,128 ;	283 ;	1395.
brevifolium ...	2,129 ;	283 ;	2473 ; No. 2471 on drawing.
canaliculatum ...	2,132 ;	284 ;	2474 ; No. 2472 on drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Crinum</i> —continued			
ensifolium ...	2,129 ;	283 ;	— ; no drawing.
latifolium ...	2,137 ;	286 ;	1818 ; <i>Crinum amabile</i> is the name on the drawing.
longifolium ...	2,130 ;	284 ;	1819.
lorifolium ...	2,131 ;	284 ;	— ; no drawing.
moluccanum ...	2,140 ;	287 ;	— ; no drawing.
nervosum ...	2,135 ;	285 ;	1548.
sumatranum ...	2,131 ;	284 ;	1961.
superbum ...	2,133 ;	285 ;	2131.
toxicarium ...	2,134 ;	285 ;	931.
zeylanicum ...	2,132 ;	286 ;	932 ; this was originally as <i>Crinum lineatum</i> Roxb. but Roxburgh has changed the name to <i>C. zeylanicum</i> in the Kew MS.
<i>Crotalaria</i> 1932			
alata ...	3,274 ;	550 ;	— ; no drawing.
angulosa ...	3,274 ;	550 ;	— ; no drawing.
bialata ...	3,274 ;	550 ;	2324.
bracteata ...	3,278 ;	551 ;	1600.
cespitosa ...	3,269 ;	548 ;	367.
chinensis ...	3,268 ;	548 ;	370.
cytisoides ...	3,276 ;	551 ;	1599 ; drawing named <i>Crotalaria elliptica</i> Roxb. but it is not the true <i>C. elliptica</i> for which see No. 1888. Also an unnumbered plate with the main figure exactly as in No. 1599, but with dissections which are not shown on 1599.
elliptica ...	3,279 ;	551 ;	1888.
fulva ...	3,266 ;	547 ;	1596.
hirsuta ...	3,270 ;	548 ;	366.
juncea ...	3,259 ;	545 ;	361 ; Pl. Corom. 193.
laburnifolia ...	3,275 ;	550 ;	363.
linifolia ...	3,266 ;	547 ;	— ; no drawing.
montana ...	3,265 ;	547 ;	372.
Nummularia ...	3,271 ;	549 ;	362.
orixensis ...	3,276 ;	550 ;	375.
paniculata ...	3,274 ;	550 ;	1887.
procumbens ...	3,278 ;	551 ;	374.
prostrata ...	3,270 ;	548 ;	368.
pulcherrima ...	3,267 ;	547 ;	1597.
quinquefolia ...	3,279 ;	552 ;	364.
ramosissima ...	3,268 ;	548 ;	1598.
retusa ...	3,272 ;	549 ;	1594.
rubiginosa ...	3,269 ;	548 ;	371.
semperflorens ...	3,274 ;	550 ;	— ; no drawing.
sericea ...	3,273 ;	549 ;	1886.
stipulacea ...	3,264 ;	546 ;	1595.
stricta ...	3,265 ;	547 ;	369 ; also an unnumbered drawing quite different from No. 369.
tenuifolia ...	3,263 ;	546 ;	2323.
tetragona ...	3,264 ;	546 ;	1593.
trifoliatum ...	3,277 ;	551 ;	373.
uniflora ...	3,271 ;	549 ;	365.
verrucosa ...	3,273 ;	550 ;	— ; no drawing.
<i>Croton</i> 2426			
bicolor ...	3,680 ;	687 ;	2558 ; No. 2551 on drawing.
bractiferum ...	3,680 ;	687 ;	— ; no drawing.
dioicum ...	3,680 ;	687 ;	— ; no drawing.
drupaceum ...	3,684 ;	688 ;	1687 & 1997 ; No. 1687 is named <i>Croton aromaticum</i> .
Halecum ...	3,683 ;	688 ;	— ; no drawing.
Joufra ...	3,685 ;	689 ;	— ; no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Croton</i> —continued				
oblongifolium ...	3,685 ;	688 ;	1295 ;	<i>Croton borogatch</i> on drawing.
plicatum ...	3,681 ;	687 ;	451.	
polyandrum ...	3,682 ;	687 ;	452.	
Tigilium ...	3,682 ;	688 ;	990.	
variegatum ...	3,678 ;	686 ;	1686.	
<i>Cryptolepis</i> <i>pauciflora</i> ...	— ;	— ;	605 ;	Wight Ic. 493 ; not in Flora Indica ; as <i>Nerium pauciflorum</i> in the Kew MS.
<i>Cucumis</i> 2473				
<i>Colocynthis</i> ...	3,719 ;	700 ;	— ;	no drawing.
<i>integrifolius</i> ...	3,724 ;	702 ;	1695.	
<i>madraspatanus</i> ...	3,723 ;	702 ;	465 ;	also an unnumbered drawing, quite different from No. 465.
<i>Melo</i> ...	3,720 ;	700 ;	— ;	no drawing.
<i>Momordica</i> ...	3,720 ;	700 ;	456.	
<i>sativus</i> ...	3,720 ;	700 ;	— ;	no drawing.
<i>trigonus</i> ...	3,722 ;	701 ;	463.	
<i>turbinatus</i> ...	3,723 ;	701 ;	464.	
<i>utilissimus</i> ...	3,721 ;	701 ;	462.	
<i>Cucurbita</i> 2471				
<i>Citrullus</i> ...	3,719 ;	700 ;	— ;	no drawing.
<i>lagenaria</i> ...	3,718 ;	700 ;	— ;	no drawing.
<i>melopepo</i> ...	3,719 ;	700 ;	— ;	no drawing.
<i>Pepo</i> ...	3,718 ;	700 ;	457.	
<i>Cuminum</i> 913				
<i>Cyminum</i> ...	2,92 ;	271 ;	— ;	no drawing.
<i>Cupressus</i> 2396				
<i>sempervirens</i> ...	3,653 ;	678 ;	— ;	no drawing.
<i>Curculigo</i> 962				
<i>orchoides</i> ...	2,144 ;	288 ;	218 ;	Pl. Corom. 13 ; also an unnumbered drawing which is almost identical with No. 218.
<i>recurvata</i> ...	2,145 ;	288 ;	1394 ;	also an unnumbered drawing which is named <i>Curculigo recurvata</i> R. in pencil in Roxburgh's hand, and which is different from No. 1394.
<i>sumatrana</i> ...	2,146 ;	288 ;	1550.	
<i>Curcuma</i> 30				
<i>aeruginosa</i> ...	1,27 ;	9 ;	1924.	
<i>Amada</i> ...	1,33 ;	12 ;	1764 ;	No. 1760 on drawing.
<i>angustifolia</i> ...	1,31 ;	11 ;	1511.	
<i>caesia</i> ...	1,26 ;	9 ;	1923.	
<i>comosa</i> ...	1,29 ;	10 ;	1925.	
<i>elata</i> ...	1,25 ;	9 ;	2002.	
<i>ferruginea</i> ...	1,27 ;	9 ;	2004.	
<i>leucorrhiza</i> ...	1,30 ;	10 ;	1926.	
<i>longa</i> ...	1,32 ;	11 ;	906.	
<i>montana</i> ...	1,35 ;	12 ;	503.	
<i>petiolata</i> ...	1,37 ;	13 ;	2156.	
<i>reclinata</i> ...	1,36 ;	12 ;	1510 ;	also an unnumbered drawing very similar to No. 1510 but with dissections not shown in 1510.
<i>rubescens</i> ...	1,28 ;	10 ;	1763 ;	No. 1761 on drawing.
<i>viridiflora</i> ...	1,34 ;	12 ;	2005.	
<i>zanthorrhiza</i> ...	1,25 ;	9 ;	2003.	
<i>Zedoaria</i> ...	1,23 ;	8 ;	1010.	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Curcuma</i> — <i>continued</i>				
Zerumbet ...	1,20 ;	7 ;	1306 ;	also an unnumbered drawing which is almost identical with No. 1306—it is inscribed “Curcuma Zerumbet—bad” in Roxburgh’s hand.
<i>Cuscuta</i> 493				
<i>aggregata</i> ...	1,447 ;	150 ;	1346.	
<i>capitata</i> ...	1,448 ;	150 ;	1789.	
<i>reflexa</i> ...	1,446 ;	150 ;	550 ;	Pl. Corom. 104.
<i>sulcata</i> ...	1,447 ;	150 ;	1790.	
<i>Cyathea</i>				
<i>pinnata</i> ...	— ;	762 ;	— ;	no drawing.
<i>tripinnatifida</i> ...	— ;	763 ;	— ;	no drawing.
<i>Cycas</i> 2503				
<i>circinalis</i> ...	3,744 ;	709 ;	1701 ;	no drawing.
<i>revoluta</i> ...	3,746 ;	709 ;	— ;	no drawing.
<i>sphaerica</i> ...	3,747 ;	709 ;	1915.	
<i>Cyclista</i> 2017				
<i>scariosa</i> ...	3,320 ;	565 ;	414 ;	Pl. Corom. 92.
<i>tomentosa</i> ...	3,319 ;	565 ;	1609 ;	drawing missing ; Pl. Corom. 221.
<i>Cymbidium</i> 2176				
<i>alatum</i> ...	3,459 ;	612 ;	2341.	
<i>aloifolium</i> ...	3,458 ;	612 ;	— ;	no drawing.
<i>amabile</i> ...	3,457 ;	612 ;	1653.	
<i>aphyllum</i> ...	3,462 ;	613 ;	241.	
<i>bambusifolium</i> ...	3,460 ;	613 ;	2336.	
<i>imbricatum</i> ...	3,460 ;	612 ;	2339.	
<i>iridifolium</i> ...	3,458 ;	612 ;	2340.	
<i>nitidum</i> ...	3,459 ;	612 ;	2337.	
<i>pendulum</i> ...	3,458 ;	612 ;	244.	
<i>praemorsum</i> ...	3,465 ;	614 ;	243.	
<i>tesselatum</i> ...	3,462 ;	613 ;	242.	
<i>tessaloides</i> ...	3,463 ;	614 ;	1288.	
<i>triste</i> ...	3,461 ;	613 ;	1648 & 2338	(no drawing).
<i>Cyminosma</i> 1064				
<i>pedunculata</i> ...	2,239 ;	319 ;	— ;	no drawing.
<i>Cynara</i> 2121				
<i>Scolymus</i> ...	3,409 ;	595 ;	— ;	no drawing.
<i>Cynoglossum</i> 606				
<i>diffusum</i> ...	1,457 ;	153 ;	1121.	
<i>marifolium</i> ...	1,457 ;	153 ;	1348.	
<i>racemosum</i> ...	1,456 ;	153 ;	1027.	
<i>Cynometra</i> 1218				
<i>polyandra</i> ...	2,372 ;	361 ;	2241 ;	Pl. Corom. 286.
<i>Cyperus</i> 201				
<i>aloppecuroides</i> ...	1,208 ;	70 ;	731 ;	originally named <i>C. glomeratus</i> but name altered to <i>C. alopecuroides</i> by Roxburgh in the Kew MS.
<i>aristatus</i> ...	1,190 ;	64 ;	709 ;	also an unnumbered drawing which is quite different from No. 709.
<i>capillaris</i> ...	1,194 ;	65 ;	713.	
<i>castaneus</i> ...	1,195 ;	65 ;	715 ;	also an unnumbered drawing which is different from No. 715.
<i>compressus</i> ...	1,194 ;	65 ;	714.	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Cyperus</i> —continued			
cruentus ...	1,196 ;	66 ;	2174.
difformis ...	1,195 ;	65 ;	716.
diffusus ...	1,189 ;	64 ;	708.
digitatus ...	1,205 ;	69 ;	730.
distans ...	1,207 ;	69 ;	726.
dubius ...	1,188 ;	63 ;	707.
elatus ...	1,204 ;	68 ;	728.
flavidus ...	1,200 ;	67 ;	722 ; also an unnumbered drawing different from No. 722.
Haspan ...	1,210 ;	70 ;	732.
incurvatus ...	1,196 ;	66 ;	2016.
inundatus ...	1,201 ;	68 ;	1110.
Iria ...	1,201 ;	67 ;	723.
jemenicus ...	1,191 ;	64 ;	733.
lateralis ...	1,186 ;	62 ;	2014.
monocephalus ...	1,188 ;	63 ;	1318 ; also an unnumbered drawing which is different from No. 1318.
mucronatus ...	1,186 ;	62 ;	704.
niveus ...	1,191 ;	64 ;	710.
nudus ...	1,187 ;	63 ;	705 ; the name <i>Cyperus nudus</i> appears twice in Flora Indica, and according to C. B. Clarke the plants described are different species ; No. 1321 is named <i>Cyperus tegetiformis</i> and this is also the name in the Kew MS.
	1,209 ;	70 ;	1321.
Pangorei ...	1,202 ;	68 ;	1111.
pectinatus ...	1,190 ;	64 ;	2015.
pertenuis ...	1,198 ;	66 ;	1320.
polystachyus ...	1,193 ;	65 ;	711.
procerus ...	1,203 ;	68 ;	725.
pumilus ...	1,196 ;	66 ;	717.
punctatus ...	1,193 ;	65 ;	712.
rotundus ...	1,197 ;	66 ;	719.
seminudus ...	1,187 ;	63 ;	706.
setaceus ...	1,185 ;	62 ;	2417 ; also an unnumbered drawing quite different from No. 2417.
spinulosus ...	1,203 ;	68 ;	727.
squarrosus ...	1,190 ;	64 ;	2418 ; no drawing.
strictus ...	1,200 ;	67 ;	721.
tegetiformis ...	— ;	— ;	1321 ; this is the name on the drawing, in the Kew MS., and in Roxb. Hort. Beng. 6 (1814), but in Flora Indica, 1, 209 (repr. 70) the description is under the name <i>Cyperus nudus</i> .
tegetum ...	1,208 ;	70 ;	1022.
tenuiflorus ...	1,199 ;	67 ;	724 & 1109.
tortuosus... ..	1,197 ;	66 ;	718.
tuberosus ...	1,199 ;	67 ;	720.
umbellatus ...	1,205 ;	69 ;	729.
verticillatus ...	1,206 ;	69 ;	1319.
Cyrilla 1746			
aquatica ...	3,115 ;	496 ;	335 ; Pl. Corom. 189.
Cytisus 2024			
Cajan ...	3,325 ;	567 ;	293.
Dactylis 383			
brevifolia ...	1,341 ;	115 ;	846.
lagopoides ...	1,341 ;	114 ;	845.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Curcuma</i> —continued				
Zerumbet ...	1,20 ;	7 ;	1306 ;	also an unnumbered drawing which is almost identical with No. 1306—it is inscribed “Curcuma Zerumbet—bad” in Roxburgh’s hand.
<i>Cuscuta</i> 493				
aggregata ...	1,447 ;	150 ;	1346.	
capitata ...	1,448 ;	150 ;	1789.	
reflexa ...	1,446 ;	150 ;	550 ;	Pl. Corom. 104.
sulcata ...	1,447 ;	150 ;	1790.	
<i>Cyathea</i>				
pinnata ...	— ;	762 ;	— ;	no drawing.
tripinnatifida ...	— ;	763 ;	— ;	no drawing.
<i>Cycas</i> 2503				
circinalis ...	3,744 ;	709 ;	1701 ;	no drawing.
revoluta ...	3,746 ;	709 ;	— ;	no drawing.
sphaerica ...	3,747 ;	709 ;	1915.	
<i>Cylista</i> 2017				
scariosa ...	3,320 ;	565 ;	414 ;	Pl. Corom. 92.
tomentosa ...	3,319 ;	565 ;	1609 ;	drawing missing ; Pl. Corom. 221.
<i>Cymbidium</i> 2176				
alatum ...	3,459 ;	612 ;	2341.	
aloifolium ...	3,458 ;	612 ;	— ;	no drawing.
amabile ...	3,457 ;	612 ;	1653.	
aphyllum ...	3,462 ;	613 ;	241.	
bambusifolium ...	3,460 ;	613 ;	2336.	
imbricatum ...	3,460 ;	612 ;	2339.	
iridifolium ...	3,458 ;	612 ;	2340.	
nitidum ...	3,459 ;	612 ;	2337.	
pendulum ...	3,458 ;	612 ;	244.	
praemorsum ...	3,465 ;	614 ;	243.	
tesselatum ...	3,462 ;	613 ;	242.	
tessaloides ...	3,463 ;	614 ;	1288.	
triste ...	3,461 ;	613 ;	1648 & 2338	(no drawing).
<i>Cyminosma</i> 1064				
pedunculata ...	2,239 ;	319 ;	— ;	no drawing.
<i>Cynara</i> 2121				
Scolymus ...	3,409 ;	595 ;	— ;	no drawing.
<i>Cynoglossum</i> 606				
diffusum ...	1,457 ;	153 ;	1121.	
marifolium ...	1,457 ;	153 ;	1348.	
racemosum ...	1,456 ;	153 ;	1027.	
<i>Cynometra</i> 1218				
polyandra ...	2,372 ;	361 ;	2241 ;	Pl. Corom. 286.
<i>Cyperus</i> 201				
alopecuroides ...	1,208 ;	70 ;	731 ;	originally named <i>C. glomeratus</i> but name altered to <i>C. alopecuroides</i> by Roxburgh in the Kew MS.
aristatus ...	1,190 ;	64 ;	709 ;	also an unnumbered drawing which is quite different from No. 709.
capillaris ...	1,194 ;	65 ;	713.	
castaneus ...	1,195 ;	65 ;	715 ;	also an unnumbered drawing which is different from No. 715.
compressus ...	1,194 ;	65 ;	714.	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Cyperus</i> —continued			
cruentus ...	1,196 ;	66 ;	2174.
difformis ...	1,195 ;	65 ;	716.
diffusus ...	1,189 ;	64 ;	708.
digitatus ...	1,205 ;	69 ;	730.
distans ...	1,207 ;	69 ;	726.
dubius ...	1,188 ;	63 ;	707.
elatus ...	1,204 ;	68 ;	728.
flavidus ...	1,200 ;	67 ;	722 ; also an unnumbered drawing different from No. 722.
Haspan ...	1,210 ;	70 ;	732.
incurvatus ...	1,196 ;	66 ;	2016.
inundatus ...	1,201 ;	68 ;	1110.
Iria ...	1,201 ;	67 ;	723.
jemenicus ...	1,191 ;	64 ;	733.
lateralis ...	1,186 ;	62 ;	2014.
monocephalus ...	1,188 ;	63 ;	1318 ; also an unnumbered drawing which is different from No. 1318.
mucronatus ...	1,186 ;	62 ;	704.
niveus ...	1,191 ;	64 ;	710.
nudus ...	1,187 ;	63 ;	705 ; the name <i>Cyperus nudus</i> appears twice in Flora Indica, and according to C. B. Clarke the plants described are different species ; No. 1321 is named <i>Cyperus tegetiformis</i> and this is also the name in the Kew MS.
	1,209 ;	70 ;	1321.
Pangorei ...	1,202 ;	68 ;	1111.
pectinatus ...	1,190 ;	64 ;	2015.
pertenuis ...	1,198 ;	66 ;	1320.
polystachyus ...	1,193 ;	65 ;	711.
procerus ...	1,203 ;	68 ;	725.
pumilus ...	1,196 ;	66 ;	717.
punctatus ...	1,193 ;	65 ;	712.
rotundus ...	1,197 ;	66 ;	719.
seminudus ...	1,187 ;	63 ;	706.
setaceus ...	1,185 ;	62 ;	2417 ; also an unnumbered drawing quite different from No. 2417.
spinulosus ...	1,203 ;	68 ;	727.
squarrosus ...	1,190 ;	64 ;	2418 ; no drawing.
strictus ...	1,200 ;	67 ;	721.
tegetiformis ...	— ;	— ;	1321 ; this is the name on the drawing, in the Kew MS., and in Roxb. Hort. Beng. 6 (1814), but in Flora Indica, 1, 209 (repr. 70) the description is under the name <i>Cyperus nudus</i> .
tegetum ...	1,208 ;	70 ;	1022.
tenuiflorus ...	1,199 ;	67 ;	724 & 1109.
tortuosus ...	1,197 ;	66 ;	718.
tuberosus ...	1,199 ;	67 ;	720.
umbellatus ...	1,205 ;	69 ;	729.
verticillatus ...	1,206 ;	69 ;	1319.
Cyrilla 1746			
aquatica ...	3,115 ;	496 ;	335 ; Pl. Corom. 189.
Cytisus 2024			
Cajan ...	3,325 ;	567 ;	293.
Dactylis 383			
brevifolia ...	1,341 ;	115 ;	846.
lagopoides ...	1,341 ;	114 ;	845.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
Dalbergia 1882				
alata ...	3,225 ;	534 ;	— ;	no drawing.
emarginata ...	3,224 ;	533 ;	1589 ;	drawing inscribed "Dalbergia obcordata Roxb."
ferruginea ...	3,228 ;	535 ;	— ;	no drawing.
frondosa ...	3,226 ;	534 ;	1884 ;	Wight Ic. 266.
krowee ...	3,229 ;	535 ;	2320 ;	drawing named <i>Dalbergia robusta</i> Roxb. and this is the name in the Kew MS.
latifolia ...	3,221 ;	532 ;	79 ;	Pl. Corom. 113.
marginata ...	3,230 ;	535 ;	2317 ;	Wight Ic. 277.
Oojeinensis ...	3,220 ;	532 ;	1588 ;	Wight. Ic. 391.
paniculata ...	3,227 ;	534 ;	81 ;	Pl. Corom. 114.
parviflora ...	3,225 ;	534 ;	— ;	no drawing.
reniformis ...	3,226 ;	534 ;	2319 ;	Wight Ic. 261.
rimosa ...	3,233 ;	536 ;	2318 ;	Wight Ic. 262.
robusta ...	— ;	— ;	2320 ;	Wight Ic. 244 ; this is the name on the drawing, in the Kew MS., and in Roxb. Hort. Beng. 53 ; the description was published in Flora Indica as <i>D. krowee</i> .
rubiginosa ...	3,231 ;	535 ;	82.	
scandens ...	3,232 ;	536 ;	84 ;	Pl. Corom. 192.
Sissoo ...	3,223 ;	533 ;	970.	
spinosa ...	3,233 ;	536 ;	— ;	no drawing.
stipulacea ...	3,233 ;	536 ;	2535 ;	No. 2529 on drawing ; Wight Ic. 243.
tamarindifolia ...	3,233 ;	536 ;	2536 ;	No. 2530 on drawing ; Wight Ic. 242.
volubilis ...	3,231 ;	536 ;	83 ;	Pl. Corom. 191.
zeylanica ...	3,228 ;	534 ;	— ;	no drawing.
Dalrymplea 880				
pomifera ...	1,633 ;	213 ;	2193 ;	Pl. Corom. 279.
Damasonium 1039				
indicum ...	2,216 ;	311 ;	662 ;	Pl. Corom. 185.
Datura 546				
fastuosa ...	1,561 ;	188 ;	— ;	no drawing.
Metel ...	1,561 ;	188 ;	— ;	no drawing.
Daucus 910				
Carota ...	2,90 ;	270 ;	— ;	no drawing.
Davallia				
angustifolia ...	— ;	761 ;	— ;	no drawing.
chinensis ...	— ;	762 ;	2579 ;	No. 2569 on drawing which is uncoloured.
cordifolia ...	— ;	761 ;	— ;	no drawing.
longifolia ...	— ;	761 ;	— ;	no drawing.
moluccana ...	— ;	762 ;	— ;	no drawing.
multiflora ...	— ;	76 ;	1758.	
pectinata ...	— ;	761 ;	— ;	no drawing.
pilosa ...	— ;	761 ;	1757.	
serrata ...	— ;	761 ;	— ;	no drawing.
trapeziformis ...	— ;	762 ;	— ;	no drawing.
Deeringia 531				
celosioides ...	1,682 ;	229 ;	929 ;	Wight Ic. 728 ; the drawing No. 929 is named <i>Celosia baccata</i> and this was the original name in the Kew MS. where Roxburgh has changed it to <i>Deeringia celosioides</i> .

Name and page-no. in Fl. Ind. MS.		Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Deeringia</i> —continued				
tetragyna	...	1,683 ;	229 ;	1377 ; Wight Ic. 729.
<i>Dendrobium</i> 2198				
acinaciforme	...	3,487 ;	621 ;	1650.
aggregatum	...	3,477 ;	618 ;	1289.
anceps	...	3,487 ;	621 ;	2360.
calceolum	...	3,488 ;	622 ;	1651.
clavatum	...	3,481 ;	620 ;	2354.
cruminatum	...	3,480 ;	619 ;	1652 ; the drawing is named <i>Epidendrum cruminatum</i> Roxb., which was the original name in the Kew MS. where Roxburgh has changed it to <i>Dendrobium cruminatum</i> Roxb.—he says it was brought from Amboyna by Mr. C. Smith. There is also at Kew an unnumbered drawing named <i>Dendrobium cruminatum</i> in Roxburgh's hand (in pencil) which is inscribed " <i>Epidendrum</i> from Amboyna by C.S." in another hand. It is quite different from No. 1652, and represents <i>Dendrobium cruminatum</i> Swarz.
flavum	...	3,479 ;	619 ;	2357 ; the name <i>D. flavum</i> Roxb. has been omitted from <i>Flora Indica</i> by error. It should be inserted on the page cited, after the account of <i>D. pumilum</i> , i.e. immediately following the line "where it blossoms after the rains".
formosum	...	3,485 ;	621 ;	2353.
pendulum	...	3,484 ;	621 ;	— ; no drawing.
Pierardi	...	3,483 ;	620 ;	1646.
pulchellum	...	3,486 ;	621 ;	2356.
pumilum	...	3,479 ;	619 ;	2358.
purpureum	...	3,484 ;	620 ;	1649.
teres	...	3,485 ;	621 ;	2355.
tripetaloides	...	3,487 ;	619 ;	2359.
veratrifolium	...	3,482 ;	620 ;	2352.
<i>Dentella</i> 738				
repens	...	1,532 ;	179 ;	545.
<i>Dianella</i> 984				
nemorosa	...	2,164 ;	295 ;	1399 ; drawing is named <i>Dianella bifaria</i> R.
<i>Dianthus</i> 1308				
caryophyllus	...	2,466 ;	385 ;	— ; no drawing.
chinensis	...	2,466 ;	385 ;	— ; no drawing.
<i>Dicksonia</i>				
moluccana	...	— ;	762 ;	— ; no drawing.
<i>Digitalis</i> 1723				
stricta	...	3,99 ;	491 ;	1259.
<i>Dillenia</i> 1565				
augusta	...	2,652 ;	452 ;	— ; no drawing.
pentagyna	...	2,652 ;	451 ;	102 ; Pl. Corom. 20.
pilosa	...	2,652 ;	452 ;	— ; no drawing.
repanda	...	2,652 ;	452 ;	— ; no drawing.
scabrella	...	2,653 ;	452 ;	— ; no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Dillenia</i> —continued				
<i>speciosa</i> ...	2,650 ;	451 ;	101	(two drawings) ; one drawing shows a flowering shoot and is numbered 101 ; the other shows the fruit and has, on the back, "No. 103. Given out July 6 1794" in an unknown hand—Roxburgh's No. 103 is <i>Buchanania latifolia</i> Roxb., a very different plant, and the number 103 must have been put on the <i>Dillenia</i> fruit by some mistake.
<i>Dioscorea</i> 2565				
<i>aculeata</i> ...	3,800 ;	728 ;	1705 ;	drawing named <i>Dioscorea spinosa</i> Roxb.
<i>alata</i> ...	3,797 ;	727 ;	1182 ;	Wight Ic. 810.
<i>anguina</i> ...	3,803 ;	728 ;	1188.	
<i>atropurpurea</i> ...	3,800 ;	728 ;	— ;	no drawing.
<i>crispata</i> ...	3,802 ;	728 ;	1706.	
<i>daemona</i> ...	3,805 ;	729 ;	1707 ;	Wight Ic. 811 ; the drawing No. 1707 is named <i>D. altissima</i> Roxb. ; there is also an unnumbered drawing virtually identical with No. 1707.
<i>fasciculata</i> ...	3,801 ;	728 ;	1186.	
<i>glabra</i> ...	3,804 ;	729 ;	— ;	no drawing.
<i>globosa</i> ...	3,797 ;	727 ;	1183 ;	Wight Ic. 812.
<i>heterophylla</i> ...	3,804 ;	729 ;	2147.	
<i>nummularia</i> ...	3,803 ;	729 ;	1189 ;	drawing bears the name <i>Dioscorea glabra</i> , in pencil, in Roxburgh's writing.
<i>oppositifolia</i> ...	3,804 ;	729 ;	477 ;	Wight Ic. 813.
<i>pentaphylla</i> ...	3,806 ;	730 ;	1187 ;	Wight Ic. 814.
<i>pulchella</i> ...	3,802 ;	728 ;	— ;	no drawing.
<i>purpurea</i> ...	3,799 ;	727 ;	1185.	
<i>rubella</i> ...	3,798 ;	727 ;	1184.	
<i>tomentosa</i> ...	3,798 ;	729 ;	998 ;	Wight Ic. 815.
<i>Diospyros</i> 1427				
<i>bracteata</i> ...	2,539 ;	415 ;	— ;	no drawing.
<i>chloroxylon</i> ...	2,538 ;	415 ;	24 ;	Pl. Corom. 49.
<i>cordifolia</i> ...	2,538 ;	415 ;	25 ;	Pl. Corom. 50.
<i>Ebenaster</i> ...	2,529 ;	412 ;	— ;	no drawing.
<i>Ebenum</i> ...	2,529 ;	412 ;	1727 ;	Wight Ic. 188 ; there is also an unnumbered drawing which diverges only slightly from No. 1727.
<i>glutinosa</i> ...	2,533 ;	413 ;	22 ;	also an unnumbered drawing which differs greatly from No. 22 so far as the flowering shoot is concerned.
<i>Kaki</i> ...	2,527 ;	412 ;	1726 ;	Wight Ic. 415.
<i>lanceaefolia</i> ...	2,537 ;	414 ;	2513 ;	No. 2508 on drawing.
<i>melanoxylon</i> ...	2,530 ;	412 ;	21 ;	Pl. Corom. 46.
<i>montana</i> ...	2,538 ;	415 ;	56 ;	Pl. Corom. 48.
<i>racemosa</i> ...	2,536 ;	414 ;	— ;	no drawing ; Wight Ic. 416.
<i>ramiflora</i> ...	2,535 ;	414 ;	1729 ;	Wight Ic. 189.
<i>Sapota</i> ...	2,535 ;	414 ;	— ;	no drawing.
<i>stricta</i> ...	2,539 ;	415 ;	2512 ;	No. 2507 on drawing.
<i>sylvatica</i> ...	2,537 ;	415 ;	23 ;	Pl. Corom. 47.
<i>tomentosa</i> ...	2,532 ;	413 ;	1728 ;	Wight Ic. 182 & 183.
<i>Dipterocarpus</i> 1525				
<i>alatus</i> ...	2,614 ;	439 ;	— ;	there is a figure of the fruit on the drawing of <i>D. turbinatus</i> No. 1565.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Dipterocarpus</i> —continued			
<i>costatus</i> ...	2,614 ;	439 ;	— ; no drawing.
<i>incanus</i> ...	2,614 ;	439 ;	— ; no drawing.
<i>pilosus</i> ...	2,615 ;	440 ;	— ; no drawing.
<i>tuberculatus</i> ...	2,614 ;	440 ;	— ; no drawing.
<i>turbinatus</i> ...	2,612 ;	439 ;	1565 ; Pl. Corom. 213.
<i>Dodonaea</i> 1082			
<i>angustifolia</i> ...	2,256 ;	324 ;	626.
<i>dioica</i> ...	2,256 ;	324 ;	1410.
<i>Dolichos</i> 1991			
<i>biflorus</i> ...	3,313 ;	563 ;	283.
<i>bulbosus</i> ...	3,309 ;	561 ;	1606.
<i>Catjang</i> ...	3,303 ;	560 ;	2086.
<i>fabaeformis</i> ...	3,317 ;	564 ;	413.
<i>falcatus</i> ...	3,311 ;	562 ;	289.
<i>gangeticus</i> ...	3,310 ;	562 ;	1160.
<i>gladiatus</i> ...	3,300 ;	559 ;	278 ; also an unnumbered drawing which is a replica of No. 278 but better coloured.
<i>glutinosus</i> ...	3,312 ;	563 ;	290.
<i>hexandrus</i> ...	— ;	— ;	2328 ; in Roxb. Hort. Beng. 55 under this name, but not in <i>Flora</i> <i>Indica</i> ; it has been added by Roxburgh to the <i>Flora Indica</i> MS. at the British Museum (Natural History) on a sheet inserted opposite p. 2014.
<i>Lablab</i> ...	3,305 ;	560 ;	282.
<i>lignosus</i> ...	3,307 ;	561 ;	281.
<i>medicagineus</i> ...	3,315 ;	564 ;	287/1.
<i>obcordatus</i> ...	3,303 ;	560 ;	2327.
<i>phaseoloides</i> ...	3,316 ;	564 ;	1890.
<i>pilosus</i> ...	3,312 ;	563 ;	291.
<i>prostratus</i> ...	3,310 ;	562 ;	288.
<i>rotundifolius</i> ...	3,302 ;	559 ;	— ; no drawing.
<i>scarabaeoides</i> ...	3,315 ;	564 ;	287/2.
<i>Dolichos</i>			
<i>sinensis</i> ...	3,302 ;	559 ;	279.
<i>Soja</i> ...	3,314 ;	563 ;	1607.
<i>tetragonolobus</i> ...	3,305 ;	560 ;	280 ; also an unnumbered drawing which agrees with No. 280 except that part is omitted.
<i>virens</i> ...	3,301 ;	559 ;	2085.
<i>Dombeya</i> 1801			
<i>ovula</i> ...	3,157 ;	511 ;	— ; no drawing.
<i>tiliaefolia</i> ...	3,157 ;	511 ;	— ; no drawing.
<i>Doodia</i> 2072			
<i>alopecuroides</i> ...	3,368 ;	581 ;	1615 ; Wight Ic. 290 ; drawing named <i>Hedysarum alopecuroides</i> Roxb.
<i>crinita</i> ...	3,369 ;	582 ;	1621 ; Wight Ic. 414 ; drawing named <i>Hedysarum crinitum</i> .
<i>hamosa</i> ...	3,367 ;	581 ;	1614 ; Wight Ic. 284 ; drawing named <i>Hedysarum hamosum</i> Roxb.
<i>lagopodioides</i> ...	3,366 ;	581 ;	975 ; Wight Ic. 289 ; originally as <i>Hedysarum lagopodioides</i> .
<i>picta</i> ...	3,369 ;	582 ;	402.
<i>simplicifolia</i> ...	3,366 ;	581 ;	— ; no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Doronicum 2148			
calcaratum ...	3,434 ;	604 ;	433.
serratum ...	— ;	— ;	1902 ; in the Kew MS. as <i>Doronicum serratum</i> Roxb. but apparently omitted from the <i>Flora Indica</i> .
Dracaena 975			
angustifolia ...	2,155 ;	292 ;	1398.
atropurpurea ...	2,160 ;	293 ;	2216.
cernua ...	2,158 ;	293 ;	— ; no drawing.
ferrea ...	2,156 ;	292 ;	1822 ; also an unnumbered drawing which is different from No. 1822.
maculata ...	2,157 ;	293 ;	2215.
spicata ...	2,157 ;	292 ;	1231.
terminalis ...	2,156 ;	292 ;	— ; no drawing.
terniflora ...	2,159 ;	293 ;	2214.
umbraculifera ...	2,158 ;	293 ;	— ; no drawing.
Drosera 927			
Burmanni ...	2,113 ;	278 ;	— ; no drawing.
Indica ...	2,113 ;	278 ;	— ; no drawing.
Durio 2110			
zibethinus ...	3,399 ;	592 ;	— ; no drawing.
Echinops 2163			
echinatus ...	3,447 ;	608 ;	1645.
Echites 661			
acuminata ...	2,15 ;	246 ;	2461 ; Wight Ic. 424.
antidysenterica* ...	2,11 ;	245 ;	6 ; Wight Ic. 439.
caryophyllata ...	2,11 ;	245 ;	603 ; Wight Ic. 440 ; also an unnumbered drawing which resembles No. 603 in general arrangement but differs in detail.
clavata ...	2,20 ;	248 ;	— ; no drawing.
cymosa ...	2,16 ;	247 ;	2463 ; Wight Ic. 395.
dichotoma ...	2,19 ;	247 ;	1036 ; Wight Ic. 438.
frutescens ...	2,12 ;	245 ;	602 ; Wight Ic. 430.
grandiflora ...	2,14 ;	246 ;	2201 ; Pl. Corom. 281.
hircosa ...	2,18 ;	247 ;	2464 ; Wight Ic. 429.
macrophylla ...	2,13 ;	246 ;	2202 ; Wight Ic. 432.
marginata ...	2,16 ;	246 ;	2462 ; Wight Ic. 425.
paniculata ...	2,17 ;	247 ;	2203 ; Wight Ic. 396.
parviflora ...	2,20 ;	248 ;	2465 ; Wight Ic. 423.
scholaris* ...	2,11 ;	245 ;	1035 ; Wight Ic. 422.
tinctoria* ...	2,11 ;	245 ;	— ; no drawing.
venenata ...	— ;	— ;	601 ; Wight Ic. 436 ; in the <i>Flora Indica</i> MS. at the British Museum (Natural History) Roxburgh has added this species on p. 674 as No. 15.
Eclipta 2153			
prostrata ...	3,438 ;	605 ;	— ; no drawing.
Ehretia 608			
aspera ...	1,598 ;	201 ;	197 ; Pl. Corom. 55.
buxifolia ...	1,598 ;	201 ;	199 ; Pl. Corom. 57.
internodis ...	1,599 ;	201 ;	— ; no drawing.
laevis ...	1,597 ;	201 ;	198 ; Pl. Corom. 56.
serrata ...	1,596 ;	200 ;	1124.
setosa ...	1,598 ;	201 ;	— ; no drawing.
uniflora ...	1,598 ;	201 ;	— ; no drawing.

* These are Nos. 1-3 of the *Flora Indica*, but, like the generic heading, were missing from Carey's copy of the *Fl. Ind.* MS.

Name and page-no. in Fl. Ind. MS.			Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<hr/>					
Ekebergia 1247					
indica ...	...		2,392 ;	367 ;	95.
Elaeagnus 485					
arborescens ...	...		1,441 ;	148 ;	2430 ; No. 2432 on plate.
conferta ...	...		1,440 ;	148 ;	1025.
triflora ...	...		1,439 ;	147 ;	1947.
Elaeocarpus 1502					
aristatus ...	...		2,599 ;	435 ;	2285 ; Wight Ic. 63.
fruticosus ...	...		2,600 ;	435 ;	— ; no drawing.
ganitrus ...	...		2,592 ;	435 ;	1984 ; Wight Ic. 66.
lanceaeifolius ...	...		2,598 ;	435 ;	2283 ; Wight Ic. 65.
lucidus ...	...		2,600 ;	435 ;	— ; no drawing.
robustus ...	...		2,598 ;	434 ;	2284 ; Wight Ic. 64.
rugosus ...	...		2,597 ;	434 ;	2286 ; Wight Ic. 61.
serratus ...	...		2,596 ;	434 ;	951.
tuberculatus ...	...		2,594 ;	433 ;	1985.
Elaeodendrum 867					
glaucom ...	...		1,638 ;	214 ;	1956.
indicum ...	...		1,640 ;	215 ;	— ; no drawing.
Elephantopus 2161					
scaber ...	...		3,445 ;	607 ;	1287.
Eleusine 385					
aegyptica ...	...		1,344 ;	116 ;	849.
calycina ...	...		1,346 ;	116 ;	852.
Coracana ...	...		1,342 ;	115 ;	847.
indica ...	...		1,345 ;	116 ;	850.
stricta ...	...		1,343 ;	115 ;	848.
verticillata ...	...		1,346 ;	116 ;	851.
Elsholtzia 1596					
villosa ...	...		3,4 ;	459 ;	— ; no drawing.
Embelia 713					
Ribes ...	...		1,586 ;	197 ;	2182.
robusta ...	...		1,587 ;	197 ;	1537 & 2183 ; No. 1537 is named <i>Ardisia pentapetala</i> Roxb. and this was the name originally in the Kew MS. where Roxburgh has altered it to <i>Embelia robusta</i> .
vestita ...	...		1,588 ;	198 ;	— ; there is a drawing of this with the number 2444, but in the Kew MS. this is <i>Ardisia lanceolaria</i> of which there is a drawing numbered 2443 ; <i>Embelia vestita</i> is not in the Kew MS. at all.
Embryopteris					
glutenifera ...	...		2,533 ;	413 ;	22 ; Pl. Corom 70 ; in Flora Indica as <i>Diospyros glutinosus</i> .
Epidendrum					
pendulum ...	...		3,458 ;	612 ;	244 ; Pl. Corom. 44 ; in Flora Indica as <i>Cymbidium pendulum</i> .
praemorsum ...	...		3,465 ;	614 ;	243 ; Pl. Corom. 43 ; in Flora Indica as <i>Cymbidium praemorsum</i> .
tesselatum ...	...		3,462 ;	613 ;	242 ; Pl. Corom. 42 ; in Flora Indica as <i>Cymbidium tessellatum</i> .
Epipactis 2171					
babianifolia ...	...		— ;	— ;	2547.
carinata ...	...		3,454 ;	610 ;	2092.
graminifolia ...	...		3,456 ;	611 ;	2546.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Epipactis</i> —continued				
Juliana ...	3,453 ;	610 ;	2091.	
plicata ...	3,455 ;	611 ;	1647.	
trinervia ...	3,455 ;	611 ;	— ;	no drawing.
<i>Equisetum</i>				
debile ...	— ;	745 ;	1921.	
<i>Eranthemum</i> 118				
barlerioides ...	1,113 ;	38 ;	— ;	no drawing.
diantherum ...	1,112 ;	38 ;	1311.	
montanum ...	1,110 ;	37 ;	98 ;	Pl. Corom. 176 as <i>Justicia montana</i> .
pulchellum ...	1,111 ;	37 ;	99 ;	Pl. Corom. 177 as <i>Justicia pulchella</i> .
racemosum ...	1,113 ;	38 ;	1263 ;	<i>Ruellia racemosa</i> on the drawing.
suffruticosum ...	1,111 ;	37 ;	1104.	
<i>Erigeron</i> 2147				
asteroides ...	3,432 ;	603 ;	432.	
<i>Erinus</i> 1715				
bilabiatus ...	3,92 ;	489 ;	1260.	
<i>Ervum</i> 2022				
hirsutum ...	3,323 ;	567 ;	1163.	
<i>Erycibe</i> 715				
paniculata ...	1,585 ;	197 ;	192 ;	Pl. Corom. 159.
<i>Erythrina</i> 1919				
arborescens ...	3,256 ;	544 ;	1591 ;	drawing missing ; Pl. Corom. 219.
indica ...	3,249 ;	541 ;	2083.	
ovalifolia ...	3,254 ;	543 ;	972 ;	Wight Ic. 247.
resupinata ...	3,257 ;	544 ;	1592 ;	drawing missing ; Pl. Corom. 220 ; there is an unnumbered drawing which differs only slightly from t. 220.
stricta ...	3,251 ;	542 ;	2322.	
suberosa ...	3,253 ;	543 ;	104.	
sublobata ...	3,255 ;	543 ;	105.	
<i>Erythroxylon</i> 1311				
laurifolium ...	2,449 ;	386 ;	— ;	no drawing.
monogynum ...	2,449 ;	386 ;	186 ;	Pl. Corom. 88.
sideroxyloides ...	2,449 ;	386 ;	— ;	no drawing.
<i>Ethulia</i> 2126				
ramosa ...	3,413 ;	597 ;	1636.	
<i>Eucalyptus</i>				
moluccana ...	2,498 ;	402 ;	— ;	no drawing.
<i>Eugenia</i> 1348				
acuminata ...	2,492 ;	400 ;	2067 ;	Wight Ic. 607.
alba ...	2,493 ;	400 ;	1069 ;	Wight Ic. 548.
amplexicaulis ...	2,483 ;	397 ;	2069 ;	Wight Ic. 608.
angustifolia ...	2,490 ;	399 ;	2135 ;	Wight Ic. 610.
aquca ...	2,492 ;	400 ;	1439 ;	Wight Ic. 550 ; also an unnumbered drawing which agrees completely with No. 1439 in some features but differs somewhat in others.
brachiata ...	2,488 ;	399 ;	1978 ;	Wight Ic. 626.
bracteata ...	2,490 ;	400 ;	151.	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Eugenia</i> —continued				
<i>caryophyllata</i> ...	2,495 ;	401 ;	2503 ;	Wight Ic. 553 ; No. 2500 on drawing.
<i>caryophyllifolia</i> ...	2,496 ;	398 ;	1142.	
<i>cerasoides</i> ...	2,488 ;	399 ;	2256 ;	Wight Ic. 615.
<i>claviflora</i> ...	2,488 ;	399 ;	2499 ;	Wight Ic. 606 ; No. 2496 on drawing.
<i>corymbosa</i> ...	2,497 ;	402 ;	1143 ;	Wight Ic. 627.
<i>cymosa</i> ...	2,492 ;	400 ;	2501 ;	Wight Ic. 614 ; No. 2498 on drawing.
<i>fruticosa</i> ...	2,487 ;	399 ;	1440 ;	Wight Ic. 624.
<i>glandulifera</i> ...	2,496 ;	402 ;	2258 ;	Wight Ic. 629.
<i>Inophylla</i> ...	2,496 ;	401 ;	2259 ;	Wight Ic. 623.
<i>Jambolana</i> ...	2,484 ;	398 ;	150.	
<i>Jambos</i> ...	2,494 ;	401 ;	1068.	
<i>lanceaefolia</i> ...	2,494 ;	401 ;	2261 ;	Wight Ic. 621.
<i>lanceolaria</i> ...	2,494 ;	401 ;	2505 ;	Wight Ic. 613 ; No. 2502 on drawing.
<i>laurifolia</i> ...	2,489 ;	399 ;	2068 ;	Wight Ic. 612.
<i>leptosperma</i> ...	2,495 ;	401 ;	— ;	no drawing.
<i>macrocarpa</i> ...	2,497 ;	402 ;	2260.	
<i>malaccensis</i> ...	2,483 ;	397 ;	1067 ;	also an unnumbered drawing which is a replica of No. 1067.
<i>myrtifolia</i> ...	2,490 ;	399 ;	2257 ;	Wight Ic. 618.
<i>oblata</i> ...	2,493 ;	400 ;	2262 ;	Wight Ic. 622.
<i>obtusifolia</i> ...	2,485 ;	398 ;	2070 ;	Wight Ic. 620.
<i>operculata</i> ...	2,486 ;	398 ;	1850 ;	Wight Ic. 552.
<i>Paniala</i> ...	2,489 ;	399 ;	2255 ;	Wight Ic. 616.
<i>polygama</i> ...	2,491 ;	400 ;	— ;	no drawing.
<i>praecox</i> ...	2,488 ;	399 ;	2500 ;	Wight Ic. 619 ; No. 2497 on drawing.
<i>pulchella</i> ...	2,496 ;	401 ;	2506 ;	Wight Ic. 628 ; No. 2503 on drawing.
<i>purpurea</i> ...	2,483 ;	397 ;	1438 ;	Wight Ic. 549.
<i>rubens</i> ...	2,496 ;	401 ;	2504 ;	No. 2501 on drawing.
<i>ternifolia</i> ...	2,489 ;	399 ;	2498 ;	Wight Ic. 611 ; No. 2495 on drawing.
<i>Thumra</i> ...	2,495 ;	401 ;	2507 ;	Wight Ic. 617 ; No. 2504 on drawing.
<i>venusta</i> ...	2,491 ;	400 ;	1560 ;	Wight Ic. 625.
<i>zeylanica</i> ...	2,490 ;	399 ;	2502 ;	No. 2499 on drawing.
<i>Euonymus</i> 869				
<i>atropurpurea</i> ...	1,627 ;	211 ;	2449 ;	No. 2450 on drawing.
<i>garcinifolia</i> ...	1,628 ;	211 ;	2186 ;	Wight Ic. 761.
<i>glabra</i> ...	1,628 ;	211 ;	— ;	no drawing.
<i>Eupatorium</i> 2126				
<i>asperum</i> ...	3,415 ;	597 ;	2545 ;	No. 2539 on drawing.
<i>divergens</i> ...	3,414 ;	597 ;	1637.	
<i>flexuosum</i> ...	3,415 ;	597 ;	— ;	no drawing.
<i>Euphorbia</i> 1329				
<i>acaulis</i> ...	2,472 ;	394 ;	— ;	no drawing.
<i>antiquorum</i> ...	2,468 ;	392 ;	1557.	
<i>arborescens</i> ...	2,468 ;	392 ;	— ;	no drawing.
<i>chamaesyce</i> ...	2,473 ;	394 ;	— ;	no drawing.
<i>cuneifolia</i> ...	2,471 ;	393 ;	— ;	no drawing.
<i>dichotoma</i> ...	2,471 ;	393 ;	— ;	no drawing.
<i>Dracunculoides</i> ...	2,474 ;	394 ;	654.	
<i>glauca</i> ...	2,473 ;	394 ;	— ;	no drawing.
<i>hirta</i> ...	2,472 ;	394 ;	— ;	no drawing.
<i>lactea</i> ...	2,468 ;	393 ;	— ;	no drawing.
<i>ligularia</i> ...	2,465 ;	392 ;	1066 & 1972.	
<i>nercifolia</i> ...	2,467 ;	392 ;	1065 & 1971.	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Euphorbia</i> — <i>continued</i>			
parviflora ...	2,473 ;	394 ;	1977.
peltata ...	2,474 ;	394 ;	1248.
sessiliflora ...	2,471 ;	393 ;	1974.
thymiflora ...	2,473 ;	394 ;	1976.
Tirucalli ...	2,470 ;	393 ;	1975.
trigona ...	2,468 ;	393 ;	1558 & 1973.
uniflora ...	2,473 ;	394 ;	— ; no drawing.
<i>Euryale</i>			
ferox ...	2,573 ;	427 ;	1452 ; Pl. Corom. 244 ; in Flora Indica as <i>Anneslea spinosa</i> .
<i>Evolvulus</i> 598			
alsinoides ...	2,106 ;	276 ;	1391.
angustifolius ...	2,107 ;	276 ;	— ; no drawing.
hirsutus ...	2,106 ;	276 ;	— ; no drawing.
pilosus ...	2,106 ;	276 ;	1815.
<i>Exacum</i> 439			
bicolor ...	1,397 ;	133 ;	— ; no drawing.
carinatum ...	1,399 ;	134 ;	1210.
sulcatum ...	1,400 ;	134 ;	1339.
tetragonum ...	1,398 ;	133 ;	1024.
zeylanicum ...	1,398 ;	133 ;	1209.
<i>Excoecaria</i> 2516			
Agallocha ...	3,756 ;	713 ;	1702.
integrifolia ...	3,757 ;	713 ;	— ; no drawing.
<i>Fabricia</i> 1341			
bracteata ...	2,477 ;	395 ;	— ; no drawing.
<i>Fagara</i> 461			
Budranga ...	1,417 ;	140 ;	2113.
nitida ...	1,419 ;	140 ;	— ; there is a drawing of this, num- bered 2430, but that number belongs to <i>Elaeagnus arborea</i> Roxb. in the Kew MS. and the drawing of that species is No. 2430. <i>Fagara nitida</i> is not in the Kew MS.
Rhetsa ...	1,417 ;	140 ;	185.
triphylla ...	1,416 ;	139 ;	2034.
<i>Fagraea</i> 629			
elliptica ...	1,462 ;	155 ;	— ; no drawing.
fragrans ...	1,461 ;	155 ;	1351.
<i>Feronia</i> 1271			
elephantum ...	2,411 ;	374 ;	74 (2 drawings) ; Pl. Corom. 141 ; one of the two drawings is the original of the Pl. Corom. plate, the other drawing seems to be an earlier version.
<i>Ferriola</i> 2555			
buxifolia ...	3,790 ;	724 ;	57 ; Pl. Corom. 45 ; Wight Ic. 763.
<i>Ferrula</i> 630			
Asia-foelita ...	2,90 ;	271 ;	— ; no drawing ; the name " <i>Asia- foelita</i> " is a mistake for <i>Assa- foetida</i> .
<i>Ficus</i> 2254			
acuminata ...	3,538 ;	639 ;	— ; no drawing.
ampelos ...	3,553 ;	644 ;	690 ; Wight Ic. 652.
angustifolia ...	3,554 ;	644 ;	692 ; Wight Ic. 660.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Fiscus</i> —continued			
asperima ...	3,554 ;	644 ;	691 ; Wight Ic. 633.
Benamina ...	3,550 ;	643 ;	688.
Carica ...	3,528 ;	635 ;	— ; no drawing.
caricoides ...	3,529 ;	636 ;	1730 ; Wight Ic. 634.
Chincha ...	3,534 ;	637 ;	— ; no drawing.
comosa ...	3,552 ;	644 ;	689 ; Pl. Corom. 125 ; Wight Ic. 658.
congesta ...	3,560 ;	646 ;	1738 ; Wight Ic. 644.
conglomerata ...	3,559 ;	646 ;	1740 ; Wight Ic. 669.
cordifolia ...	3,548 ;	642 ;	1198 ; Wight Ic. 640.
cunia ...	3,561 ;	646 ;	1739 ; Wight Ic. 648.
daemona ...	3,562 ;	647 ;	1737 ; Wight Ic. 641.
elastica ...	3,541 ;	640 ;	2141 ; Wight Ic. 663.
exasperata ...	3,555 ;	644 ;	1734 ; Wight Ic. 664.
excelsa ...	3,552 ;	643 ;	1732 ; Wight Ic. 650 ; drawing is named <i>Ficus altimuraloa</i> Roxb.
fructuosa ...	3,533 ;	637 ;	2369 ; Wight Ic. 654.
glomerata ...	3,558 ;	646 ;	685 ; Pl. Corom. 123 ; Wight Ic. 667.
Goolereea ...	3,538 ;	639 ;	— ; no drawing.
hederacea ...	3,538 ;	639 ;	2371 ; Wight Ic. 653.
heterophylla ...	3,532 ;	637 ;	693 ; Wight Ic. 659.
hirsuta ...	3,528 ;	636 ;	2367 ; Wight Ic. 670.
hirta ...	3,531 ;	636 ;	2366 ; Wight Ic. 672.
humilis ...	3,535 ;	638 ;	2097 ; Wight Ic. 635.
Indica ...	3,539 ;	639 ;	682.
infectoria ...	3,551 ;	643 ;	1098 ; Wight Ic. 665.
laccifera ...	3,545 ;	640 ;	2368 ; Wight Ic. 656.
laminosa ...	3,531 ;	636 ;	— ; no drawing.
lanceolata ...	3,557 ;	645 ;	1736 ; Wight Ic. 645.
Luducca ...	3,534 ;	637 ;	— ; no drawing.
macrophylla ...	3,556 ;	645 ;	1004 ; Wight Ic. 673.
obtusifolia ...	3,546 ;	641 ;	2370 ; Wight Ic. 662.
oppositifolia ...	3,561 ;	647 ;	686 ; Pl. Corom. 124 ; Wight Ic. 638.
palmata ...	3,529 ;	636 ;	— ; no drawing.
polycarpa ...	3,556 ;	645 ;	1735 ; Wight Ic. 632.
quercifolia ...	3,534 ;	637 ;	1920 ; Wight Ic. 646.
racemifera ...	3,560 ;	646 ;	1299 ; Wight Ic. 639.
radicans ...	3,536 ;	638 ;	2375 ; Wight Ic. 671.
ramentacea ...	3,547 ;	642 ;	2374 ; Wight Ic. 657.
rapiformis ...	3,541 ;	643 ;	1731 ; Wight Ic. 637.
religiosa ...	3,547 ;	642 ;	683.
repens ...	3,535 ;	638 ;	1099 ; Wight Ic. 636.
rotundifolia ...	3,556 ;	645 ;	— ; no drawing.
scabrella ...	3,532 ;	637 ;	2372 ; Wight Ic. 661.
scandens ...	3,536 ;	638 ;	2376 ; Wight Ic. 643.
sclerophylla ...	3,546 ;	641 ;	— ; no drawing.
squamosa ...	3,531 ;	636 ;	— ; no drawing.
tomentosa ...	3,550 ;	643 ;	687 ; Wight Ic. 647.
Tsiela ...	3,549 ;	642 ;	684 ; Wight Ic. 668.
tuberculata ...	3,554 ;	644 ;	2377 ; Wight Ic. 651.
urticifolia ...	3,553 ;	644 ;	— ; no drawing.
vagans ...	3,537 ;	638 ;	2373 ; Wight Ic. 655.
virgata ...	3,530 ;	636 ;	1919 ; Wight Ic. 649.
Wassa ...	3,539 ;	639 ;	1733 ; Wight Ic. 666 ; drawing named <i>Ficus laciniata</i> .
<i>Flacourtia</i> 2599			
cataphracta ...	3,834 ;	739 ;	1093.
inermis ...	3,833 ;	739 ;	1713 ; drawing missing ; Pl. Corom. 222 ; there is an unnumbered drawing which is almost identical with t. 222 but has an extra branch.
obcordata ...	3,835 ;	740 ;	— ; no drawing.
Ramontchi ...	3,834 ;	739 ;	— ; no drawing.
sapida ...	3,835 ;	739 ;	127 ; Pl. Corom. 69.
sepiaria ...	3,835 ;	739 ;	126 ; Pl. Corom. 68.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Flagellaria</i> 974 <i>indica</i> ...	2,154 ;	291 ;	623.
<i>Flemingia</i> 2038 <i>angustifolia</i> ...	3,341 ;	573 ;	— ; no drawing.
<i>congesta</i> ...	3,340 ;	572 ;	1278 ; Wight Ic. 390 ; drawing named <i>Hedysarum trinervia</i> .
<i>lineata</i> ...	3,341 ;	572 ;	1624 ; drawing named <i>Millingtonia lineata</i> Roxb.
<i>nana</i> ...	3,339 ;	572 ;	1622 ; Wight Ic. 389 ; drawing named <i>Millingtonia nana</i> Roxb.
<i>procumbens</i> ...	3,338 ;	571 ;	1893.
<i>prostrata</i> ...	3,338 ;	572 ;	1894.
<i>semi-alata</i> ...	3,341 ;	572 ;	1623 ; drawing missing ; Pl. Corom. 249 ; Wight Ic. 326 ; also an unnumbered drawing quite different from the Pl. Corom. plate, but named "Flemingia semialata R." in Roxburgh's hand.
<i>stricta</i> ...	3,342 ;	573 ;	401 ; Pl. Corom. 248.
<i>Foetida</i> 1368 <i>maritima</i> ...	2,498 ;	402 ;	— ; no drawing.
<i>Fragaria</i> 1392 <i>indica</i> ...	2,520 ;	409 ;	1445.
<i>malayana</i> ...	2,520 ;	409 ;	1857.
<i>Fraxinus</i> 162 <i>chinensis</i> ...	1,148 ;	50 ;	2012.
<i>Fuirena</i> 194 <i>ciliaris</i> ...	1,180 ;	60 ;	770 ; <i>Fuirena glomerata</i> in Kew MS. ; also an unnumbered drawing different from No. 770 but resembling it in some ways.
<i>Fumaria</i> 1878 <i>parviflora</i> ...	3,217 ;	531 ;	— ; no drawing.
<i>Gaertnera</i> 1219 <i>obtusifolia</i> ...	2,369 ;	360 ;	1842.
<i>racemosa</i> ...	2,368 ;	360 ;	205 ; Pl. Corom. 18.
<i>Galedupa</i> 1905 <i>elliptica</i> ...	3,242 ;	539 ;	1590 ; Wight Ic. 420.
<i>indica</i> ...	3,239 ;	538 ;	292 ; also an unnumbered drawing quite different from No. 292.
<i>marginata</i> ...	3,241 ;	539 ;	2537 ; drawing numbered 2531.
<i>piscidia</i> ...	3,240 ;	538 ;	2321 ; Wight Ic. 86.
<i>uliginosa</i> ...	3,243 ;	539 ;	971.
<i>Galega</i> 2092 <i>diffusa</i> ...	3,387 ;	588 ;	1900.
<i>Heyneana</i> ...	3,384 ;	587 ;	1629 ; Wight Ic. 388.
<i>incana</i> ...	3,385 ;	587 ;	1630 ; Wight Ic. 371.
<i>lanceaefolia</i> ...	3,386 ;	587 ;	2087.
<i>pentaphylla</i> ...	3,384 ;	587 ;	1628 ; Wight Ic. 376.
<i>purpurea</i> ...	3,386 ;	587 ;	— ; no drawing.
<i>spinosa</i> ...	3,383 ;	587 ;	409 ; Wight Ic. 372.
<i>tinctoria</i> ...	3,387 ;	588 ;	— ; no drawing.
<i>villosa</i> ...	3,385 ;	587 ;	— ; no drawing.
<i>Garcinia</i> 1532 <i>Cambugia</i> ...	2,621 ;	442 ;	2280 ; Pl. Corom. 298.
<i>cornea</i> ...	2,629 ;	444 ;	1446 ; Wight Ic. 105.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Garcinia</i> —continued				
Cowa	2,622 ;	442 ;	945 ;	Wight Ic. 104 ; the drawing bears only the name <i>Garcinia celebica</i> in pencil, but it corresponds so completely with Wight's t. 104 for which he cites <i>G. Cowa</i> Roxb. as a synonym, that there can be no doubt that it is No. 945.
kydia	2,623 ;	442 ;	2282 ;	Wight Ic. 113 ; <i>G. kydiana</i> in Kew MS.
lanceaefolia ...	2,623 ;	442 ;	2278 ;	Wight Ic. 103.
Mangostana ...	2,618 ;	441 ;	2136.	
paniculata ...	2,626 ;	443 ;	1064 ;	Wight Ic. 112.
pedunculata ...	2,625 ;	443 ;	1562 ;	Wight Ic. 114, 115.
pictorea ...	2,627 ;	444 ;	2279 ;	Wight Ic. 102.
purpurea ...	2,625 ;	443 ;	— ;	no drawing.
zeylanica ...	2,621 ;	442 ;	2281.	
<i>Gardenia</i> 754				
arborea	1,708 ;	238 ;	17 ;	Wight Ic. 576.
calyculata ...	1,704 ;	236 ;	— ;	no drawing.
campanulata ...	1,710 ;	238 ;	1810 ;	Wight Ic. 578.
costata	1,704 ;	237 ;	2048.	
dumetorum ...	1,713 ;	240 ;	10 ;	Pl. Corom. 136 ; Wight Ic. 580 ; in Flora Indica as <i>Posoqueria dumetorum</i> .
florida	1,703 ;	236 ;	1034.	
fragrans	1,717 ;	241 ;	13 ;	Pl. Corom. 137 ; in Flora Indica as <i>Posoqueria fragrans</i> .
gummifera ...	1,709 ;	238 ;	— ;	no drawing.
latifolia	1,706 ;	237 ;	11 ;	Pl. Corom. 134 ; Wight Ic. 574.
lucida	1,707 ;	237 ;	1542 ;	Wight Ic. 575.
montana	1,709 ;	238 ;	16 ;	Wight Ic. 577 ; also an unnumbered drawing which is similar to No. 16 in the flowering and fruiting shoot, but differs in other respects.
tetrasperma ...	1,709 ;	238 ;	— ;	no drawing.
turgida	1,711 ;	239 ;	2455 ;	Wight Ic. 579 ; No. 2456 on drawing.
uliginosa	1,712 ;	239 ;	12 ;	Pl. Corom. 135 ; in Flora Indica as <i>Posoqueria uliginosa</i> .
<i>Garuga</i> 1254				
pinnata	2,400 ;	370 ;	45 ;	Pl. Corom. 208 ; the drawing No. 45 is of a flowering shoot, but there is also an unnumbered drawing of a fruiting shoot with an inflorescence separate.
<i>Gastonia</i> 1266				
palmata	2,407 ;	373 ;	2246.	
sasuroides ...	2,408 ;	373 ;	— ;	no drawing.
<i>Gelonium</i> 2608				
bifarium	3,830 ;	738 ;	999.	
fasciculatum ...	3,832 ;	738 ;	124.	
lanceolatum ...	3,831 ;	738 ;	1998.	
<i>Gentiana</i> 551				
cherayta	2,71 ;	264 ;	1041.	
verticillata ...	2,71 ;	264 ;	234 ;	Wight Ic. 600.
Genus Novum ...	2,225 ;	314 ;	1133 ;	this has been identified as <i>Pternandria coerulescens</i> Jack.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. 1874)	Roxb. No.	
Gerardia 1722 delphinifolia ...	3,98 ;	491 ;	337 ;	Pl. Corom. 90.
Getonia 1289 floribunda ...	2,428 ;	379 ;	140 ;	Pl. Corom. 87.
nutans ...	2,428 ;	379 ;	2495 ;	No. 2492 on drawing.
Gisekia 927 pharnaceoides ...	— ;	— ;	596 ;	Pl. Corom. 183 ; apparently completely omitted from Flora Indica.
Glechoma 1600 erecta ...	3,7 ;	460 ;	1570.	
Globba 83 bulbifera ...	1,78 ;	26 ;	— ;	no drawing.
Careyana ...	1,80 ;	27 ;	2008.	
Hura ...	1,79 ;	27 ;	— ;	no drawing.
marantina ...	1,77 ;	26 ;	1308 ;	drawing is named <i>Colebrookea bulbifera</i> Roxb.
orixensis ...	1,78 ;	26 ;	504 ;	Pl. Corom. 229.
pendula ...	1,79 ;	27 ;	1014 ;	Pl. Corom. 228.
radicalis ...	1,81 ;	27 ;	1307 ;	Pl. Corom. 230 ; in Flora Indica as <i>G. subulata</i> .
spatulata ...	1,83 ;	28 ;	2163.	
subulata ...	1,81 ;	27 ;	1307 ;	Pl. Corom. 230 as <i>G. radicalis</i> .
Gloriosa 962 superba ...	2,183 ;	288 ;	— ;	no drawing.
Glycine 2014 debilis ...	3,318 ;	565 ;	1608.	
labialis ...	3,318 ;	565 ;	407.	
tenuiflora ...	3,319 ;	565 ;	406.	
Gmelina 1700 arborea ...	3,84 ;	486 ;	71 ;	Pl. Corom. 246 ; also an un- numbered drawing which is quite different from No. 71, and a better figure altogether.
asiatica ...	3,87 ;	487 ;	70.	
oblongifolia ...	3,83 ;	485 ;	2306.	
parviflora ...	3,87 ;	487 ;	318 ;	Pl. Corom. 162 as <i>G. parvifolia</i> which is the name on the drawing — in the Kew MS. the name is <i>G. parviflora</i> as published in Flora Indica.
villosa ...	3,86 ;	486 ;	1875.	
Gnaphalium 2138 albo-luteum ...	3,425 ;	601 ;	1171.	
depressum ...	3,425 ;	600 ;	427.	
multicaule ...	3,425 ;	600 ;	— ;	no drawing ; in the Flora Indica MS. Roxburgh has, under <i>G. orixense</i> , "Compare this and the last with <i>G. multicaule</i> Willd. Sp. Pl. iii. 1888", but he does not have <i>G. multicaule</i> as part of the Flora, and the remarks under it belong to <i>G. orixense</i> .
orixense ...	3,425 ;	600 ;	426.	
strictum ...	3,424 ;	600 ;	425.	

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Gnetum</i> 2243			
gnemon ...	3,518 ;	632 ;	— ; no drawing.
scandens ...	3,518 ;	632 ;	2364.
<i>Gomphrena</i> 530			
globosa ...	2,63 ;	262 ;	— ; no drawing.
<i>Gordonia</i> 1478			
decandra ...	2,573 ;	426 ;	— ; no drawing.
integrifolia ...	2,572 ;	426 ;	2315.
oblata ...	2,572 ;	426 ;	1586.
<i>Gossypium</i> 1835			
acuminatum ...	3,186 ;	520 ;	1498.
arborescens ...	3,183 ;	519 ;	1494 ; drawing is inscribed "1496 <i>Gossypium rubicundum</i> R." but No. 1496 in the Kew MS. is Dacca Cotton the drawing of which is numbered 1494—evi- dently the numbers were trans- posed by error, as also with 1493 & 1495.
Barbadense ...	3,187 ;	521 ;	1499.
herbaceum ...	3,184 ;	520 ;	1495 & 1496 ; Pl. Corom. 269 (=1495) ; drawings bear numbers 1493 & 1494 respectively.
hirsutum ...	3,187 ;	521 ;	— ; no drawing.
obtusifolium ...	3,183 ;	519 ;	1493 ; No. 1495 on drawing.
religiosum ...	3,185 ;	520 ;	1497 ; drawing named <i>Gossypium friscum</i> Roxb.
vitifolium ...	3,186 ;	520 ;	— ; no drawing.
<i>Gouania</i> 897			
tiliaefolia ...	1,632 ;	212 ;	583 ; Pl. Corom. 98.
<i>Gratiola</i> 147			
alata ...	1,137 ;	46 ;	— ; no drawing.
amara ...	1,135 ;	45 ;	1314.
cuneifolia ...	1,142 ;	48 ;	— ; no drawing.
grandiflora ...	1,136 ;	46 ;	521 ; Pl. Corom. 179.
hyssopioides ...	1,141 ;	47 ;	527 ; Pl. Corom. 128.
integrifolia ...	1,137 ;	46 ;	— ; no drawing.
involucrata ...	1,137 ;	46 ;	— ; no drawing.
junccea ...	1,142 ;	48 ;	528 ; Pl. Corom. 129.
lobelioides ...	1,142 ;	48 ;	— ; no drawing.
lucida ...	1,138 ;	46 ;	523 ; Pl. Corom. 202.
Monnieri ...	1,141 ;	47 ;	520 ; Pl. Corom. 178.
oppositifolia ...	1,139 ;	47 ;	526 ; Pl. Corom. 155.
parviflora ...	1,140 ;	47 ;	524 ; Pl. Corom. 203.
racemosa ...	1,138 ;	47 ;	— ; no drawing.
reptans ...	1,140 ;	47 ;	1516.
rotundifolia ...	1,137 ;	46 ;	525 ; Pl. Corom. 204.
serrata ...	1,139 ;	47 ;	1515.
veronicifolia ...	1,138 ;	46 ;	522 ; Pl. Corom. 154.
<i>Grewia</i> 1491			
asiatica ...	2,586 ;	431 ;	223.
aspera ...	2,591 ;	432 ;	228.
begonifolia ...	2,592 ;	433 ;	— ; no drawing.
carpinifolia ...	2,587 ;	431 ;	224.
didyma ...	2,591 ;	432 ;	229.
excelsa ...	2,586 ;	431 ;	— ; no drawing.
heteroclita ...	2,591 ;	432 ;	— ; no drawing.
hirsuta ...	2,587 ;	431 ;	226.
lanceaefolia ...	2,586 ;	431 ;	— ; no drawing.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Grewia—continued</i>				
obliqua ...	2,590 ;	432 ;	— ;	no drawing.
oppositifolia ...	2,583 ;	430 ;	1858 ;	Wight Ic. 82.
orientalis ...	2,586 ;	431 ;	222.	
paniculata ...	2,591 ;	432 ;	1860.	
pedicellata ...	2,585 ;	431 ;	— ;	no drawing.
pilosa ...	2,588 ;	431 ;	1447.	
polygama ...	2,589 ;	431 ;	1448.	
salvifolia ...	2,587 ;	431 ;	225.	
sapida ...	2,590 ;	432 ;	1291.	
scabrophylla ...	2,584 ;	430 ;	1859 ;	Wight Ic. 89 ; in the Kew MS. the name is <i>G. sclerophylla</i> .
sepiaria ...	2,589 ;	432 ;	1290.	
tiliaefolia ...	2,587 ;	431 ;	227.	
ulmifolia ...	2,592 ;	432 ;	1983 ;	Wight Ic. 84.
umbellata ...	2,591 ;	432 ;	2519 ;	Wight Ic. 83 ; No. 2513 on drawing.
<i>Grislea</i> 1058				
tomentosa ...	2,233 ;	317 ;	175 ;	Pl. Corom. 31.
<i>Guarea</i> 1065				
binectarifera ...	2,240 ;	319 ;	1832.	
paniculata ...	2,242 ;	320 ;	2229 ;	Wight Ic. 146.
<i>Guetarda</i> 887				
speciosa ...	1,686 ;	230 ;	33.	
<i>Gynocardia</i>				
odorata ...	3,836 ;	740 ;	2409 ;	Pl. Corom. 299 ; in Flora Indica as <i>Chaulmoogra odorata</i> .
<i>Gyrocarpus</i> 491				
Jacquini ...	1,445 ;	149 ;	135 ;	Pl. Corom. 1.
<i>Hamiltonia</i> 779				
pilosa ...	1,556 ;	187 ;	— ;	no drawing.
suaveolens ...	1,554 ;	186 ;	1364 ;	drawing missing ; Pl. Corom. 236 as <i>Spermadictyon suaveolens</i> ; there is an unnumbered drawing almost a replica of t. 236 but with more flowers.
<i>Hardwickia</i> 1248				
binata ...	2,423 ;	378 ;	1432 ;	drawing missing ; Pl. Corom. 209.
pinnata ...	2,425 ;	378 ;	— ;	no drawing.
<i>Harpullia</i> 848				
cupanioides ...	1,645 ;	217 ;	2187.	
<i>Hastingia</i> 1677				
coccinea ...	3,65 ;	480 ;	964.	
scandens ...	3,66 ;	480 ;	— ;	no drawing.
<i>Hedychium</i> 21				
angustifolium ...	1,13 ;	5 ;	2154 ;	Pl. Corom. 251.
coronarum ...	1,10 ;	4 ;	907.	
flavum ...	1,12 ;	4 ;	2153.	
gracile ...	1,14 ;	5 ;	sub 2154 ;	Pl. Corom. 251 ; the descrip- tion is not numbered in the Kew MS. but follows that of No. 2154 and drawings of a leaf and floral dissections are on the plate of that number, i.e. <i>H. angustrifolium</i> .

Name and page-no. in Fl. Ind. MS.		Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
Hedyotis 407				
Auricularia	...	1,365 ;	122 ;	— ; no drawing.
geniculata	...	1,364 ;	122 ;	— ; no drawing.
hispida	...	1,364 ;	122 ;	1206.
lineata	...	1,365 ;	122 ;	— ; no drawing.
scandens	...	1,364 ;	122 ;	2176.
Hedysarum 2046				
alatum	...	3,348 ;	575 ;	1896.
Alhagi	...	3,344 ;	574 ;	— ; no drawing.
alopecurioides	...	3,344 ;	573 ;	1615 ; Wight Ic. 290.
arborescens	...	3,361 ;	579 ;	— ; no drawing.
articulatum	...	3,355 ;	577 ;	1619 ; Wight Ic. 298 ; drawing is named <i>H. auriculatum</i> , which is the name in the Kew MS. and in Roxb. Hort. Beng. 57.
biarticulatum	...	3,359 ;	578 ;	397 ; Wight Ic. 419.
bracteatum	...	3,351 ;	576 ;	1612 ; Wight Ic. 268.
bupleurifolium	...	3,346 ;	574 ;	392.
cephalotes	...	3,360 ;	579 ;	1620 ; Wight Ic. 373.
collinum	...	3,349 ;	575 ;	393.
diffusum	...	3,356 ;	578 ;	1618 ; Wight Ic. 409.
diphyllum	...	3,353 ;	576 ;	— ; no drawing.
gangeticum	...	3,349 ;	575 ;	1610 ; Wight Ic. 271.
glumaceum	...	3,347 ;	574 ;	— ; no drawing.
gramineum	...	3,346 ;	574 ;	394 ; Pl. Corom. 194 as <i>H. bupleurifolium</i> but the plate and description are of Roxburgh's No. 394, <i>H. gramineum</i> ; Roxburgh's drawing and account of <i>H. bupleurifolium</i> are under his No. 392.
gyrans	...	3,352 ;	576 ;	1082 ; Wight Ic. 294.
juncum	...	3,362 ;	580 ;	1898.
lagenarium	...	3,365 ;	580 ;	298 ; Wight Ic. 299 ; drawing named <i>Aeschynomene aspera</i> .
latifolium	...	3,350 ;	575 ;	1611 ; Wight Ic. 270.
moniliferum	...	3,345 ;	574 ;	— ; no drawing.
Neli-tali	...	3,365 ;	580 ;	299 ; drawing named <i>Aeschynomene indica</i> .
patens	...	3,362 ;	579 ;	1617 ; Wight Ic. 407.
procumbens	...	3,345 ;	574 ;	395 ; Wight Ic. 408.
pulchellum	...	3,361 ;	579 ;	1613 ; Wight Ic. 418.
purpureum	...	3,358 ;	578 ;	1279 ; Wight Ic. 406.
quinquangulatum	...	3,355 ;	577 ;	398 ; Wight Ic. 293.
recurvatum	...	3,358 ;	578 ;	1616 ; Wight Ic. 374.
reptans	...	3,354 ;	577 ;	1897 ; Wight Ic. 291.
sennoides	...	3,364 ;	580 ;	403 ; Wight Ic. 297.
sororium	...	3,352 ;	576 ;	396.
strobiliferum	...	3,350 ;	575 ;	1276 ; Wight Ic. 267.
styracifolium	...	3,347 ;	574 ;	1895.
triflorum	...	3,353 ;	577 ;	405 ; Wight Ic. 292.
triquetrum	...	3,348 ;	575 ;	1277.
tuberosum	...	3,363 ;	580 ;	400 ; Wight Ic. 412.
umbellatum	...	3,360 ;	579 ;	399.
vaginale	...	3,345 ;	574 ;	— ; no drawing.
viscidum	...	3,356 ;	578 ;	404 ; Wight Ic. 286.
vespertilionis	...	3,352 ;	576 ;	1165.
Helianthus 2160				
annuus	...	3,443 ;	607 ;	— ; no drawing.
Heliconia 516				
buccinata	...	1,670 ;	225 ;	2127.

Name and page-no. in Fl. Ind. MS.	Fl. Ind. (1832)	Fl. Ind. (1874)	Roxb. No.
<i>Helicteres</i> 1788			
Isora ...	3,143 ;	506 ;	1436.
<i>Heliotropium</i> 601			
coromandelianum	1,454 ;	153 ;	1120.
indicum ...	1,454 ;	152 ;	1026.
paniculatum ...	1,455 ;	153 ;	— ; no drawing.
<i>Hemierocallis</i> 989			
cordata ...	2,168 ;	296 ;	— ; no drawing.
fulva ...	2,168 ;	296 ;	— ; there is an unnumbered drawing which is probably one of Rox- burgh's.
<i>Hemionitis</i>			
cordifolia ...	— ;	756 ;	1750.
reticulata ...	— ;	756 ;	— ; no drawing.
<i>Heritiera</i> 1781			
littoralis ...	3,142 ;	506 ;	— ; no drawing.
minor ...	3,142 ;	506 ;	1197.
<i>Hernandia</i> 2312			
ovigera ...	3,577 ;	652 ;	1668.
<i>Heynea</i> 1245			
quinquijuga ...	2,391 ;	367 ;	sub 1843 ; no drawing.
trijuga ...	2,390 ;	367 ;	1843 ; Pl. Corom. 260.
<i>Hibiscus</i> 1844			
Abelmoschus ...	3,202 ;	526 ;	— ; no drawing.
aculeatus ...	3,206 ;	527 ;	356.
cancellatus ...	3,201 ;	525 ;	1580.
cannabinus ...	3,209 ;	528 ;	355 ; Pl. Corom. 190.
chinensis ...	3,212 ;	529 ;	— ; no drawing.
collinus ...	3,198 ;	525 ;	360.
diversifolius ...	3,208 ;	528 ;	— ; no drawing.
fragrans ...	3,195 ;	523 ;	— ; no drawing.
furcatus ...	3,204 ;	527 ;	1582 ; drawing named <i>H. bifurcatus</i> .
heterophyllus ...	3,214 ;	530 ;	1506 ; drawing named <i>H. procerus</i> .
hirtus ...	3,203 ;	526 ;	1503 ; drawing named <i>H. moschatus</i> .
Lampas ...	3,197 ;	524 ;	1502 ; drawing named <i>H. gangeticus</i> ; also an unnumbered drawing, a replica of No. 1502.
longifolius ...	3,210 ;	528 ;	1156.
mutabilis ...	3,201 ;	525 ;	— ; an unnumbered drawing named <i>H. mutabilis rosea</i> may be one of Roxburgh's.
pentaphyllus ...	3,212 ;	529 ;	1583 ; drawing named <i>H. quinquephyllus</i> .
phoeniceus ...	3,194 ;	523 ;	357 ; also an unnumbered drawing different from No. 357.
populneoides ...	3,191 ;	522 ;	352.
populneus ...	3,190 ;	522 ;	351.
prostratus ...	3,208 ;	528 ;	— ; no drawing.
pruriens ...	3,196 ;	524 ;	359.
pumilus ...	3,203 ;	526 ;	350.
pungens ...	3,213 ;	529 ;	1585.
radiatus ...	3,209 ;	528 ;	1584.
rigidus ...	3,195 ;	524 ;	358.
Rosa-Sinensis ...	3,194 ;	523 ;	— ; no drawing.
scandens ...	3,200 ;	525 ;	— ; no drawing.
setosus ...	3,194 ;	523 ;	1271.
Solandra ...	3,197 ;	524 ;	1501.
strictus ...	3,206 ;	527 ;	1505 ; also an unnumbered drawing which is a replica of No. 1505.

Name and page-no. in Fl. Ind. MS.	Fl. 3nd. (1832)	Fl. Ind. (1874)	Roxb. No.	
<i>Hibiscus</i> — <i>continued</i>				
<i>Surattensis</i> ...	3,205 ;	527 ;	1504.	
<i>syriacus</i> ...	3,195 ;	523 ;	— ;	no drawing.
<i>tetralocularis</i> ...	3,198 ;	524 ;	— ;	no drawing.
<i>tetraphyllus</i> ...	3,211 ;	529 ;	1079.	
<i>tiliaceus</i> ...	3,192 ;	522 ;	1500.	
<i>tortuosus</i> ...	3,192 ;	523 ;	1883.	
<i>tricuspid</i> ...	3,202 ;	526 ;	— ;	no drawing.
<i>truncatus</i> ...	3,200 ;	525 ;	1581.	
<i>tubulosus</i> ...	3,196 ;	524 ;	672.	
<i>vitifolius</i> ...	3,200 ;	525 ;	1078.	
<i>Hingtsha</i> 2166				
<i>repens</i> ...	3,448 ;	609 ;	1173.	
<i>Hippocratea</i> 181				
<i>arborea</i> ...	1,167 ;	56 ;	1316 ;	drawing missing ; Pl. Corom. 205 ; there is an unnumbered drawing almost identical with Pl. Corom. 205, but not the original of that plate.
<i>indica</i> ...	1,165 ;	55 ;	533 ;	Pl. Corom. 130.
<i>obtusifolia</i> ...	1,166 ;	56 ;	2013.	
<i>Hiraea</i> 1309				
<i>indica</i> ...	2,448 ;	386 ;	162.	
<i>nutans</i> ...	2,447 ;	386 ;	2253.	
<i>rotundifolia</i> ...	2,449 ;	386 ;	— ;	no drawing.
<i>Holcus</i> 357				
<i>ciliatus</i> ...	1,318 ;	107 ;	2031.	
<i>nervosus</i> ...	1,318 ;	107 ;	2030.	
<i>Holigarna</i> 852				
<i>longifolia</i> ...	2,80 ;	267 ;	2130 ;	Pl. Corom. 282.
<i>racemosa</i> ...	2,82 ;	268 ;	2213.	
<i>Hopea</i> 1522				
<i>eglandulosa</i> ...	2,611 ;	438 ;	— ;	no drawing.
<i>odorata</i> ...	2,609 ;	438 ;	1247 ;	drawing missing ; Pl. Corom. 210.
<i>scaphula</i> ...	2,611 ;	438 ;	2517.	
<i>Hordeum</i> 402				
<i>hexastichon</i> ...	1,358 ;	120 ;	— ;	no drawing.
<i>Hovenia</i> 896				
<i>dulcis</i> ...	1,630 ;	211 ;	2045.	
<i>Humea</i> 1555				
<i>elata</i> ...	2,640 ;	448 ;	1482 (drawing missing) & 2137 ;	Pl. Corom. 265 as <i>Brownlowia elata</i> .
<i>Hunteria</i> 636				
<i>corymbosa</i> ...	1,695 ;	233 ;	1380 ;	Wight Ic. 428.
<i>Hydrocotyle</i> 823				
<i>asiatica</i> ...	2,88 ;	270 ;	1385 ;	Wight Ic. 565.
<i>rotundifolia</i> ...	2,88 ;	270 ;	1386 ;	Wight Ic. 564.
<i>Hydrophylax</i> 1417				
<i>maritima</i> ...	1,373 ;	125 ;	1336 ;	Pl. Corom. 233.